



SATURDAY, MAY 3, 1873.

## A Railroad Panic.

No doubt there are a great many people in Illinois who honestly believe that the railroad corporations are the greatest enemies the farmers have to contend with. This has not always been their idea; it is not, we think, the belief of unprejudiced observers anywhere. Railroads have developed Illinois. They are certainly to be credited with a part of that prosperity which has made the crop of that State second in value of all the States in the Union. A large number of the roads were built in spite of great obstacles and discouragements, with money of which Illinois did not contribute a cent. To the liberal management of these roads it is due that a great city has been built up at the foot of Lake Michigan, and that the products of the vast prairies of Illinois are within easy reach for marketing on the seaboard and in Europe. From these facts it would not be difficult to argue that corporations which have done so much for the State have earned the right to be treated liberally; that their past history is a guaranty that, left to themselves, they might confer still further benefits; that by crippling them and restricting their energies and diminishing the inducement to enter upon great undertakings, the real source of the prosperity of the great State is cut off. But an argument of this kind would not be listened to at the present time. Public opinion has been carefully and skillfully manipulated. The agitation has been nursed with such tact that there is not a newspaper in Illinois nor a public man who has expectations with the courage to stand against the clamor for rigid State regulation of railroads and their charges. We have no doubt that the panic will pass away. The goose that lays golden eggs will not be killed, because she will be taken under the protection of those who only feign an intention to take her life. Meanwhile all the railroad corporations are confronted by a really angry mob, and every person who hints that popular opinion may be going too far is set upon as an apologist for monopoly.

The Railroad Committee of the Illinois Legislature—or rather a select Committee of thirteen on this subject—has just reported a bill to take the place of the abortive act of the last Legislature, declared unconstitutional by the Supreme Court. This bill, which is declared by the *Chicago Tribune* to be the best yet brought forward, and which is certainly less objectionable than those which have preceded it, is a most ingenious but ineffectual attempt to break the contracts which the State made with the companies in giving them their charters. The state of public feeling in Illinois may be inferred from the fact that the *Tribune*—and we trust we shall not do it any injury when we say that it is in this controversy the most wisely conservative of all the newspapers in the State—does not venture openly to oppose this bill, which we shall presently describe, but contents itself with criticizing details. Some bill or other the people of Illinois are determined to have, and it is the part of wisdom to make it as good or as bad as possible, that the experiment may be fairly tried, or shown to be impracticable.

The charters of some, and we think the most, of the Illinois railroads, give them the right to establish their rates of fare and freight. The Supreme Court has decided, and no doubt properly, that this cannot be held to sanction extortionate or unjustly discriminating rates. Accordingly the bill is "to prevent extortion and unjust discrimination." It enacts that any company which shall charge more than "a fair and reasonable rate" shall be guilty of extortion. Unjust discrimination is defined to be charging on passengers or freight of the same class carried in the same direction for any distance, the same or a greater sum than is charged for a greater distance; levying higher terminal charges at one point than at another; charging more for a certain distance than is required for another equal distance on another point of the road; charging more to one person than to another for the same service; or charging less for any kind of service from or to competing points than is charged for the same or greater service elsewhere. This is nothing more nor less than declaring that the only "fair" rate is one absolutely *pro rata*. It does not matter that a railroad company can afford to handle grain in Chicago more cheaply than at a country station, the charges must be the same. It makes no difference that near the large cities, where travel is largest and most regular, the companies can carry passengers at a lower rate than through an undeveloped country. The man who buys his travel wholesale by commutation or season tickets is to have no advantage over the old lady who once a year visits her old cronies at the next station. To yield to the commuter compels the company to lower its inflexible mileage rate. To grant special terms to the farmer of a thousand acres requires the corporation to diminish its charges to the producer of a dozen bushels of corn and to reduce its scale at every station along its whole line.

A "fair" rate being thus established, it only remains to make it "reasonable." This part of the duty is entrusted to the Railway and Warehouse Commissioners, who are directed to make for each corporation "a schedule of reasonable maximum rates of charges for the transportation of passengers and freight," and this schedule is to be taken as *prima facie* evidence in all suits that the rates therein fixed are reasonable maximum rates. There is not an enactment in the whole bill that does not throw the burden of proof on the accused party. It is this final provision that takes away the last vestige of the right granted in the charters to establish rates. An irresponsible board of State officers, anxious to conciliate the people and desirous, above all things, of being popular, will be certain, especially in the present temper of the citizens of Illinois, to make the "maximum" rate as low as the minimum rate heretofore charged. But whether this were so or not, it is absurd to speak of allowing the companies to establish their own rates when they are deprived of all discretionary power except that of saying whether their mileage passenger rate shall be what the Commissioners declare to be reasonable, or a smaller sum. The right granted them by their charters is taken away by indirection. The new bill is quite as objectionable in effect, though not in terms, as the unconstitutional law of last winter, and we do not believe the courts will sustain its validity. If it passes, the railroads will certainly not obey it, and before a judicial decision can be rendered, the present unreasonable state of mind of the people of Illinois will perhaps have given way to one more temperate.—*Boston Advertiser*.

## Improvement in Iron Truss Bridges.

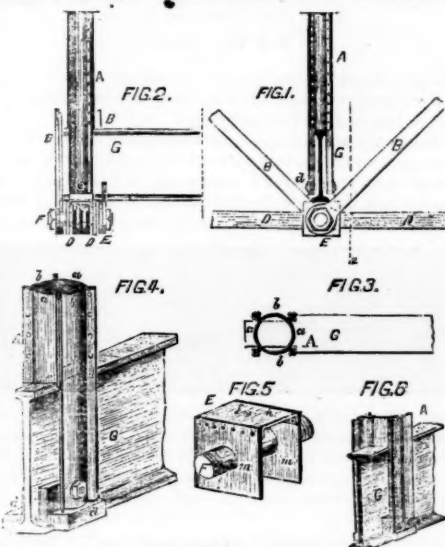
The accompanying engraving and description are from the specification of a patent issued to Mr. Thomas C. Clarke, of Philadelphia, and dated November 5, 1872:

My invention consists of a truss-frame bridge in which the floor-beams, posts and braces are connected and supported as fully described hereafter, the object of my invention being to insure economy and simplicity in the construction of iron bridges.

In the accompanying drawing, fig. 1 is a side view of sufficient of a truss-frame bridge to illustrate my invention; fig. 2, a transverse section of fig. 1 on the line 1, 2; fig. 3, a sectional plan on the line 3, 4, fig. 2; fig. 4, a perspective view, illustrat-

ing the mode of connecting the post to the floor-beam; fig. 5, a perspective view of the bearer, and fig. 6 illustrates a modification of my invention.

A represents the lower portion of the vertical post of a truss-frame bridge; B and B', the diagonal and counter-diagonal stays; D D, the lower chord-links; E, the bearer, and F, the pin which connects the diagonals and chord-links to the bearer, and G, part of one of the floor beams. It is the common practice in bridges of this class to suspend the floor beams from the pin F by bolts—a plan which has been considered by many engineers to be more or less precarious, especially as the nuts of the bolts, on the integrity of which the safety of the structure depends, are exposed, and may be easily tampered with by evil-disposed persons. I obviate this evil in the manner which I will now proceed to describe: The post is, in the present instance, made of wrought iron, in accordance with the invention of S. J. Reeves, patented June 17, 1862, and is composed of four flanged bars, *a a* and *b b*, as best observed in the perspective view, fig. 4, and at the lower end of the post the opposite bars *a a* are cut away for the admission of the ends of the floor beam G, which is of the well-known character known as a Phoenix beam. The bars *b b* of the post are continued downward, and are arranged to bear on blocks *d d*, fitted to the lower flange and to the web of the beam, a horizontal bolt, *e*, passing through the whole, as shown in fig. 4. The flange of the beam and the blocks *d d* rest on the bearer E, fig. 5, which is maintained in position by a simple steady-pin, *f*, this bearer being composed, in the present instance, of two plain plates, *m m*, of wrought iron, riveted to the flanges of a strip, *n*, of channel iron. The pin *f* passes through the said plates and through the eyes of the diagonals B and B', and through those of the lower chord-links D D. It will now be



seen that the floor beam as well as the post is supported by the pin which connects together the diagonals and lower chord-links.

I claim as my invention—

The combination, with the bearer E, pin F, and diagonals and links, of the beam G and pivot A, the side bars of which rest on blocks *d*, supported directly by the bearer, the whole being connected as set forth.

## Liability of a Corporation for Debt of a Company which has been Consolidated with it.

Judge Rogers, of the Cook County (Ill.) Circuit Court, on the 19th of April gave a decision on this point in a case which we find thus reported in the *Chicago Tribune*:

W. B. Skidmore sued the Columbus, Chicago & Indiana Central Railroad Company for the amount of notes made by the Chicago & Cincinnati Railroad, and given by them to plaintiff. Since the making of the notes the latter company was amalgamated with the Chicago & Great Eastern Railroad, under the latter name, and the new company amalgamated with the Columbus & Indiana Central Railroad Company under the name in which defendants are sued. The notes were for \$2,749.68 and \$1,076.71, payable in eight months after the date thereof, signed by W. D. Judson, President, and countersigned by Amos Tenney, Treasurer, and payable to the order of T. Munro, the first dated March 10, 1861, the second August 12, 1861. The defendant held that the present company was not the one which made the note and cannot legally be held liable therefor. His Honor took another view of the case, however, and gave judgment in favor of plaintiff, with \$6,830.91 damages. As this case involves a feature of peculiar interest we summarize the decision of the Court. After referring to the feature of the case already narrated, Judge Rogers said:

"By these several consolidations there has been, in fact, a change of the names of the several companies into that of the Columbus, Chicago & Indiana Central Railway Company, by which name it is sued in the action. The old Columbus, Chicago & Indiana Central Railroad has a legal existence in Indiana, yet it is in a sort of suspended animation. It has no Director, no President, Secretary or Treasurer, acting in the original corporate name. All its rights, properties, and so forth, have been absorbed, and its name changed to that of the defendant here. This is shown by its own act, the articles of condition, as decided in the case of the R. & M. R. Co. v. T. F. L. & T. R. Co., 49 Ill., 319. It, with other consolidated companies, became substantially a new corporation, in a legal point of view, and was and has rendered a distinct corporation in each State, and a common board of directors. There is an Indiana corporation, under the new name, and there is an Illinois corporation, under the new name, and the original corporations in each State have been transmuted into these. These several companies are now operating by one board of directors. If the company that made the notes sued on exists in Indiana, it must be under the new name, and the presumption, in the absence of evidence to the contrary, is that it can be sued by that name in this State, and the process can be served on its officers, there being such officers here of the old company under the new name. Then under our statute the company can be brought into court by summons on those officers. The articles of consolidation show an abandonment of old names and the putting on, or assumption, of the new one. This operates as an estoppel to deny the change of name. It is an admission of change of name in Indiana, as well as in Illinois; the averment of the declaration as to the change of name is sustained by the proofs—the articles of consolidation—and I am of opinion that the suit is well brought, and that the real maker of the note is before the Court by its new, its present and the only name by which it transacts business, and by which it can be found and served with process in this State."

## Contributions.

## A Railroad Ride in California—Chinese as Railroad Hands.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Not long ago I had occasion to make a journey to the front on the California & Oregon Railroad, which is now pushed well into the extreme upper Sacramento Valley. I embarked at the little station of Sheridan, Placer County. On some of our great Western railroads, and especially in California, it is phenomenal what an abject hovel of a station one leaves to get aboard what a magnificent palace of a car. So it was here.

The trip thence to the front manifested nothing especially remarkable, except that it is very agreeable to ride on a first-class road and be absolutely free from the nuisance of fruit and candy peddlers. Not one of these wretched individuals made his appearance on the train going up, but coming back we were greeted once only by the new-boy with "the latest Sacramento papers" (from which the Union is carefully excluded).

The railroad train has a strangely exotic and hot-bed appearance in California, as in Russia; it seems forced, premature, not prepared for, not springing from the wants of the people, but thrust upon the country by extraneous capital. Said Nicholas to his engineer, drawing a straight line on the map between St. Petersburg and Moscow, "Build me a road there." The Central Pacific goes straight about its own business, and if there are any little towns by the wayside, well and good; if they are off to one side of the great natural lines of travel and engineering, so much the worse for them. There are Shasta, Weaver and Yreka—all mining towns strung along necessarily as close to the placers as possible, and therefore perched half-way up the mountain—and now they look down from their elevated eyries with ill-concealed jealousy and disgust upon the incipient towns which the railroad is building along the Sacramento, where runs the main track of empire. Those little towns are horse towns—not to say one-horse towns—whose best days have gone forever by, and no railroad in its senses is going to climb the mountain to find them. There is Visalia, too, down in the San Joaquin Valley, a town in a good agricultural region and therefore taking hold on an indefinite future; but the demands of good engineering left it several miles on the left. This policy of the Central Pacific, among other things, has aroused against it a fierce and bitter opposition—for every little California town is accustomed to speak of "the Pacific coast" when it means only itself—but for my part, though I am by no means an apologist for the Central Pacific, I like this broad and long-sighted policy, which builds for the great future and not for the passing hour. The trouble is, simply, that California was laid out for a mining country, and now has to be revamped for an agricultural country; and any great railroad that leans on a mine leans on a broken reed.

Then, too, there is something suggestive of Russia, though greatly unlike it, in the spectacle of a railroad train bowling over these lonesome and hungry wastes, singing with a clear, dry whirr through the desert air. The red light at evening slowly fading over the vast, treeless plains, where broods a dead, grim silence; the few little shanties, standing absolutely naked and alone on the tawny expanse; the occasional herds of cattle or flocks of turkeys tended by a solitary horseman—all these give an air of inexpressible lonesomeness and desolation to the scene, and make the gorgeous interior of the palace car seem more and more exotic and a hotheaded growth. Surely gold has done this, and not wheat; though the wheat must maintain what the gold created.

In approaching a railroad front in California, the traveler runs a long gauntlet of Chinese encampments, and it is a strange and interesting spectacle which they present. They always prefer to camp beside a creek or river, but if they are compelled to stop on the open plain they have their ovens dug in the iron-hard earth wherever there is a bit of a shoulder in the surface. The interior of their small tents is very neatly kept, with their beds and mats all of bamboo spread on the ground. There are numbers of wash-houses, which consist simply of tents erected among the willows beside a pond, or sheer in the dry bed of the creek. The Chinese have learned well from Americans the art of following up a railroad front with all manner of saloons, sutleries, gambling dens, strange women, and other concomitants of a great railroad work.

At one place there is quite a Mongolian village of camp followers by the roadside, formed of improvised board-shanties standing right amid the chapparal—all Chinese. The gorgeous and flaunting red letters of the signs set up on these "dead-falls" are full of poetry and the most beautiful morality, as "Balcony of Joy and Delight," for a restaurant; and "Over-running Abundance," or "Heavenly Felicity," or "Riches Ever Flowing," for a gambling den; and "Foreign Smoke in Broken Parcels," for an opium-smoking den. But within they are full of uncleanness and abominations, and there nightly the games of *fan tan* and "blowing the fiat" go on lively, sometimes until long after midnight, or until the wretched debauchees have spent the last dollar of their week's wages.

The Chinese have naturalized very few English words into their language, for the reason that the genius of their tongue is so entirely different from ours. They prefer to create a word outright. Their word for "railroad" is *ta-lui keei han-lu*, which signifies "Thundering Devil Road," and locomotive is "Thundering Devil."

I have tried many times, but always without success, to ascertain the average daily ration consumed by the Chinese railroad laborer, as a means of comparing their value with that of Americans. The reason this cannot be obtained is because they eat so many oily gallimaufries, alliacious stews and indescribable vegetable hotchpotches, of which the ingredients are principally brought from China and have Chinese names. But the price paid them serves the purpose pretty well, for in a free and open market a thing will eventually fetch what it is worth and no more. A Chinese railroad laborer receives \$1 a day and



boards himself, an American, \$1.15 a day and is boarded. Messrs. Sisson & Wallace, who have large contracts for supplying Chinamen, inform me that the average cost of their board is \$3 per week. In California 75 cents a day, or \$5.25 a week, is considered about the value of a workingman's board. By taking the above wages and adding the board to one and subtracting it from the other, we have a Chinaman's work worth \$4 a week, and the American's \$13.25; in other words the value of the American railroad laborer is to that of the Chinese is as 3.31 to 1. This result seems rather startling, and perhaps something ought to be allowed on the Chinese side for the element of prejudice, though a "soulless corporation" will not allow itself to be swerved from its interest very much by any such consideration. And it is the almost universal testimony of contractors, overseers, section-masters, etc., that they would rather have an American at an American price than a Chinese at a Chinese price.

And certainly they are quite trifling laborers, as any man with half an eye can perceive for himself. Look at a dozen of them tugging at a hawser in a most innocent and infantile way and budging nothing. They are as thick as bees around any work, and they dodge, duck, tread on one another's feet, grin, bump about, and—do nothing under the sun. A great company of them, as many as can stand around it, will trot along after a flat car, always grinning, but saying nothing. They make a prodigious to-do and a "ho-yo!" when they lift at a stick of bridge-timber, but they positively do not lift twenty pounds apiece, the cunning rascals. Watch them shoveling earth on the embankment. They scoop and spoon up a little earth and listlessly toss it a short distance, allowing the blade of the shovel to drop to the ground every time. A man who lets his shovel blade drop after every throw is not worth his salt.

The occasion of the first introduction of Chinese labor on California railroads was rather curious. The Central Pacific Company had struggled on for several years, with what white laborers they could get by strenuous appeals through news-

plank the truss, which we put up on the top of the bent, and a strong wind is blowing normal to the structure, there will be more force exerted on top than on the bottom; and so with any direction of the wind, although I believe it is the most severe when the wind is normal to the longitudinal part of the structure. It becomes a rather complicated calculation to find the center of gravity of the combined structure, the boxed-up Howe truss and the open work of the bent.

Next, how many posts do we have to put in the lower story; for which I cannot find any rule. I send you the problem in general terms; it may be you will have to change it a little, not being so well posted with your language as I ought to be, and so using two words where you would use one:

"A deep ravine has to be crossed, 200 to 140 feet deep, and we conclude to put up wooden bents, lumber being the handiest material to be got. We put the piers 60 or 100 feet, or any distance, apart, a Howe truss, or any other kind of truss, on top of it. Now the question is, How broad has the base to be, or how how much batter do we have to give crosswise, and how much longitudinally, to the bent? How many posts are we to put in the lowest story, and what is the general rule for similar structures of different heights, and how far apart can we put the posts with safety? Do you think that 40 feet per square foot is too much for wind pressure?"

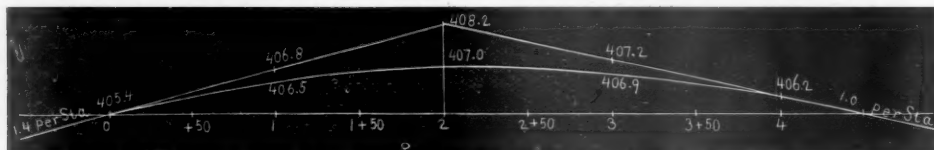
F. VAN HAEFTEN.

### Vertical Curves.

TO THE EDITOR OF THE RAILROAD GAZETTE:

For a simpler manner of calculating vertical curves of 400 feet in length, I send the following:

Rule.—Average the rate of grade per station, and subtract this average from the grade elevation at the summit, for the new elevation at same point: one-fourth of this average subtracted from the grade-elevation at the two stations, 1 and 3—on each side of summit—will give the new grade-elevations for



paper advertisements, but at length they saw the Union Pacific, dormant at first, now gaining on them and crossing the Plains with startling strides. The strongest appeals they could make by double-headed and display-headed advertisements were of no avail; the miserable vagabond *canaille* of San Francisco made no response. The company were in despair.

Then suddenly there came one of those mining stampedes (to White Pine, I believe,) to which California was subject. All at once there were hundreds, there were thousands, of laboring men applying for work on the railroad. They were even anxious to go. The company were rejoiced, they saw now a swift way out of their trouble; here were hundreds of lusty fellows. Of course, they all got a free ride to the front. Once there, the rascals decamped to a man; they all ran off to the new diggings. The company were left in the lurch. This was the last straw that broke the camel's back. They boldly broke over all conventionalities, all barriers of prejudice, and sent for the Chinese. They came, to the number, eventually, of 8,000.

At first they were employed only in the most menial capacities, as in the shovel brigade or ax brigade. Then they were intrusted with horses and drays, under a white overseer—generally forty-five in a gang. Then the ablest of them were occasionally promoted to be overseers of gangs. I once heard one boast in a saloon, "Me big laiload man; alle same Charley Clocker." There are Chinamen who have fought through the whole railroad campaign of California, who are now veterans in the service, trusted and faithful section hands. Next they rose to the dignity of conductors on Chinese trains. They now ride freely in any car except the hindmost, that arrant humbug called "the ladies' car"—at least when they are well dressed. Lastly, one of them was promoted to the high and responsible post of General Agent or Commissioner in Sacramento, to be in attendance on all trains for the purpose of instructing his traveling countrymen about routes, fares, trains, etc.—a kind of minister plenipotentiary from China to the State of Central Pacific. This high dignity is an offense and an eyesore to many foolish Americans passing through Sacramento; but his appointment was eminently an act of common sense.

STEPHEN POWERS.

### Wind Pressure on a Truss Bridge, and other Bridge Questions.

ANN ARBOR, April 23, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

SIR: I often notice in your paper a great many questions in regard to engineering asked and answered. I therefore thought to write you, in the hope that you would insert my problem and that one of your readers might be willing to give his knowledge to his not so able brother.

I have been trying to design a large trestle bent or wooden pier, say 140 to 200 feet high, but have not been able to make a design which satisfied me. I wish to make one at the same time of the strongest and still the most economical form—that is, with the least amount of feet board measure in it.

I have been looking in several books, and found that Professor Rankine, "Civil Engineering," page 485, formula 5, gives more information than any of them on that subject. But I found it rather up-hill work to use his formula on account of finding the length of the lever arm "Y." Because when we

them. One-eighth of this same average will, if subtracted from the grade-elevation at 0 + 50 and 3 + 50, give the new elevations at those points; and 0.562 the same average, if subtracted from the grade-elevations at 1 + 50 and 2 + 50, will give their new elevations.

Example.—

$$\frac{1.4 + 1.0}{2} = 1.2 \text{ average;}$$

and

$$408.2 - 1.2 = 407.0 \text{ new elevation at station 2.}$$

$$406.8 - \frac{1.2}{4} = 406.5 \text{ new elevation at station 1.}$$

$$407.2 - \frac{1.2}{4} = 406.9 \text{ new elevation at station 3.}$$

$$406.1 - \frac{1.2}{8} = 406.025 \text{ new elevation at } 0 + 50.$$

$$406.7 - \frac{1.2}{8} = 406.625 \text{ new elevation at } 3 + 50.$$

$$408.2 - 1.2 \times 0.562 = 406.836 \text{ new elevation at } 1 + 50.$$

$$407.7 - 1.2 \times 0.562 = 407.026 \text{ new elevation at } 2 + 50.$$

W. M. J.

DALLAS, TEXAS.

### Cheap Railroads.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Alignment.—Curves are in all cases a serious and permanent objection, and as trade increases they become a still greater nuisance. Yet it is utterly impossible to construct a railroad without their use, and consequently they are a necessary evil; and when we come to examine them more closely, especially on roads of small traffic and slow speed, they become less objectionable, the friction and consequently the wear and tear decreasing very rapidly with the speed.

On many roads a limit of 6 degrees, or 955 feet radius, is used. This, or even 3 degrees or 1,910 feet radius, may be a proper maximum on through lines, or roads doing a large business; but when you have to expend much money on local lines to carry out that principle, it then becomes erroneous. When great roads like the Baltimore & Ohio, the Pennsylvania, and the Erie are forced, for the sake of economy, to submit to curves of from 400 feet to 700 feet radius, what, might I ask, should be the limit for a road doing a business of from \$3,000 to \$5,000 per mile? Should it demand a better alignment, at as great a proportional cost, than the great through lines? Why not, then, on local lines use, when necessary for economy's sake, sharp curves? How often do we see cuts 15 to 20 feet deep which could have been avoided by a little more curvature, and how many roads have been rendered bankrupt by a succession of heavy cuts and fills, nearly all of which could have been avoided by sharper curves.

Grades.—On the same principle, the engineer and directors of a local line desire as a maximum the same grades and curves as upon the adjacent through routes, when their business would readily allow of an increase of at least 50 per cent. And even then, after having adopted a grade of say 50 feet, how seldom is it carried out; how often does he expend hundreds, if not thousands, of dollars to make an intermediate grade of 30 or 40 feet when his trains will still have to encounter the 50-foot grade.

On nearly all roads there is a large preponderance of the trade in a particular direction. This is a well-established fact, which an engineer should always be prepared to use; but

few do, in adjusting grades. Suppose that preponderance to be two to one, which is perhaps the minimum, and the grade against the trade 52 feet per mile. Then a grade of 75 feet per mile in the direction of the trade would make a material reduction in cost of construction, in many cases 25 per cent., without any material disadvantages in the future working of the road.

The peculiar location of the country, together with the prospective trade, must determine the grade and curvature: what would be judicious in one locality would be the reverse in another, and their proper adjustment will show the skill and judgment of the engineer.

It is the universal complaint against engineers that they are extravagant and impracticable, and we must all admit that there is much truth in the charge. On the other hand, many directors and capitalists think that because a man can run the transit and level, or make a pretty map, therefore he is an engineer, and that as their road is short anybody will answer as their Chief Engineer, and then complain that their road has cost over \$30,000 per mile, when it should not have cost more than \$15,000, forgetting that they have been penny-wise and pound-foolish.

The road-bed or embankments should be from 10 to 14 feet wide (I have seen on big roads even less temporarily used), the narrow to be used on fills of three feet and under, the width increasing with the height of fill. Cuts to be from 12 to 16 feet wide, depending upon length, depth and material.

Track.—The cross-ties to be 6 x 8 in. x 9 feet long, 2,640 to the mile. The weight of iron will depend entirely upon circumstances. On many roads now laid with 60 lb. rail, 30 to 40 lbs., with suitable machinery, would answer equally well. Care should be taken to use the best joint. As comparatively few Western local roads are ballasted, care must be taken that the end of cross-ties are not covered. In fact, the bottom of them had better project a little, so as to give a free outlet to the water.

Rolling Stock.—The proper proportion of rolling stock to the work to be done has had, on local roads, less attention than perhaps anything in relation to their management. The passenger business, generally equal in both directions, varying in different days and in direction near cities in parts of a day, close observation soon enables the superintendent to make a correct approximate estimate for each train. In thickly populated Massachusetts, the average number per train is 63, and on ten of the roads the average is only 32. On many of the Western and Southern roads it is still less. What would probably be the seating required? Would not two cars of 30 seats each be generally amply sufficient, keeping on hand, at prominent points, extra cars for extraordinary occasions? A train consisting of two passenger cars and one mail-baggage car would weigh when loaded not over 40 tons. A 12-ton engine would give abundant power to take such a train, with additional cars when necessary, on a road with grades of over 60 feet per mile, at a speed of 15 or 20 miles per hour.

I well remember the day when the express trains on the Baltimore & Ohio road were run between Baltimore and Cumberland, over 80 feet grades and sharp curves, by 10-ton Norris engines.

It is true that the short car is not as pleasant or as easy as the long car; you might urge the same objections to street cars or to steamboats on local routes, which cannot afford the same style and luxury as those upon long through lines. How few of our roads own an engine weighing less than 20 or 25 tons. My observation in travel (and from reports), particularly upon Western roads, is that they have too much seating, and that the passenger engines are entirely too heavy for the work they have to do, and that in many roads the dead weight could be reduced more than half and still offer every reasonable comfort to passengers. The speed of the passenger train being greater than of freight causes much more damage to the track. Therefore a reduction in their weight would materially reduce the cost of repairs of track and roadway. D. H. K.

### Mr. Wellington's Labor-Saving Formulae.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As a constant reader of your valuable paper I have been much interested with the recent contributions of some of your correspondents. Many of the formulae on curves by Mr. Wellington, published in your issue of the 12th inst. are very concise and convenient, and fully justify the title of "labor-saving formulae;" but with your permission I would be glad to correct an erroneous impression which your correspondent labors under when he claims originality for them and states that "none of them have ever been in print before."

In the case of Problem 1.

"Given the radius, R, and total angle, D, of a curve, to determine the distance, D, fig. 1" (see GAZETTE, April 12), Mr. Wellington gives:

$$D = \frac{R}{\cos \frac{1}{2} A} - R; \text{ which of course } = R (\sec \frac{1}{2} A - 1).$$

Now this latter expression for D may be found in a little work entitled a "Manual of Railway Engineering in Ireland," by C. P. Cotton, an eminent and accomplished engineer well known in Dublin. I have myself made use of this formula in the field to find the middle point of a curve, and have appended it as a foot-note to page 49 of Henck, where it is a decided improvement on the equation for this distance, viz.:

$$D = R \tan \frac{1}{2} I \tan \frac{1}{2} I.$$

The above work is published by Ponsonby, of Dublin, and contains many valuable hints for the young engineer. Though Irish in name, it is quite cosmopolitan in character, being adapted to the practice of the profession all the world over, and deserves to be better known. It is included in the curriculum of the Engineering School of Trinity College, Dublin, where I first became acquainted with it, and a perusal of it will, I think, justify my observations. G. H. SYKES, C. E., B. A.

HAMILTON, Ont., Canada, April 19, 1873.



## Train Dispatchers' Association.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Would it not be a good idea to have a "Train Dispatchers' Association" organized, to meet annually or semi-annually, for the consideration and discussion of rules and regulations, etc., for moving trains by telegraph.

This has become an important branch in railroading, and is worthy of careful study and consideration.

The united efforts of the organization could certainly make some valuable suggestions to the Railroad Association of America.

Let us hear from some of our train dispatchers. R.

[About a year ago a similar suggestion was made by several correspondents, and a call was issued for such a convention, or for correspondence concerning the proper time and place for holding one, since which time we have heard nothing further concerning the matter.—EDITOR RAILROAD GAZETTE]

## Steam-Excavators.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am desirous of obtaining some information in regard to what are called steam-excavators or elevators, or steam-shovels.

If you could inform me where some of the best patterns are made, and which in your opinion is the best for the purpose of loading gravel from a low bank into cars, you will greatly oblige G. F. A.

[The above is a sample of a number of letters which we have received from parties who make inquiries about these machines. We will suggest to manufacturers of them that it would be profitable for them to advertise their wares.—EDITOR RAILROAD GAZETTE.]

## Reporting Accidents in Massachusetts.

The following is the copy of an Act concerning accidents on railroads, passed at the present session of the Massachusetts Legislature:

SECTION 1. The Board of Railroad Commissioners shall investigate the causes of any accident on a railroad resulting in loss of life, and of any accident not so resulting which, in their judgment, shall require investigation.

SEC. 2. Notice of the occurrence of any accident upon a railroad, resulting in loss of life, and of any accident not so resulting of which the Board of Railroad Commissioners shall, by general regulation, require notice, shall be given to said Board by the corporation operating the road upon which such accident occurs, and within twenty-four hours thereafter; and a corporation, for each omission to give such notice, shall be liable to a penalty of one hundred dollars, to be recovered by indictment.

SEC. 3. Section 14 of Chapter 408 of the Acts of the year 1869 is repealed.

The Railroad Commissioners have sent out the following circular, accompanying copies of the above law, to the railroad companies of the State:

The Board of Railroad Commissioners would call your attention to the accompanying law concerning accidents on railroads—Chapter 98 of current year. Under Section 2, the Commissioners require that you will make immediate report to them of any accident resulting in personal injury or loss of life, whether of passengers, employees, or others. The Commissioners also require that you will report accidents which do not result in personal injury, but which cause detention of passenger trains upon your road, when resulting from any of the following causes, to wit:

- Breaking or falling of any bridge structure.
- Draw-bridge left open.
- Collisions of trains meeting, or head collisions.
- Collisions of trains overtaking, or rear collisions.
- Collisions with vehicles at crossings of highways.
- Malicious obstruction upon track, stating character.
- Accidental obstruction upon track, stating character.
- Misplaced switches.
- Cattle on track.
- Rails removed for repairs of track.
- Spreading of rails.
- Defective frog.
- Explosion of locomotive boiler.
- Failure of locomotive, stating what portion.
- Failure of cars, stating what portion.
- Trains breaking apart.
- Derailment, caused by snow or ice.
- Derailment, caused by broken rail.

To facilitate the early transmission of reports of accidents to the Board, it has prepared blanks for such reports, some of which are herewith sent to you.

## Experiments with the "Weston" Locomotive Boiler.

The following reports of experiments made by the patentee of this boiler on the Lake Shore & Michigan Southern Railway have been forwarded to us for publication:

## REPORT OF THE WESTON BOILER ENGINE NO. 417, March 3, 1873.

From Elkhart to Chicago, 100 miles, with 34 freight cars, 19 of them loaded. Left at 9 a. m.; arrived at 9 p. m.

Time on road, 18 hours. The weather extremely cold, with thermometer at zero; heavy snow storm prevailing. The engine consumed 8,709 lbs. of coal in the run of 100 miles, using no wood, making 87.09 lbs. coal per mile run.

Coal used per 1 mile run... 87.09  
Add to equal the coal used by the ordinary boiler engine 18.79 per cent. .... 16.36

Total.....103.45

The ordinary-boiler engine used on this trip 18.79 per cent. more coal than the Weston boiler engine.

The dynamometer placed between the tender and train for the purpose of showing which was the heaviest train, or to show the resistance overcome by each engine on starting from

a dead stop and at certain points while running, registered as follows:

On starting at Elkhart.....13,500  
" South Bend.....12,500  
" Running.....10,000  
" Carlisle.....14,000  
" Running.....13,000  
" Laporte.....12,500  
" Running.....13,500

Total.....89,000

Recapitulation.

The direct saving in coal by Weston boiler was.....18.79  
The train hauled by Weston boiler engine was heavier than her competitors by.....25.18

In favor of Weston's boiler.....43.97

The number of cars hauled and weight of train was intended to be equal, but the dynamometer showed a difference in weight or in resistance overcome, caused doubtless by the difference in the weather. The ordinary boiler engine running in fair, pleasant weather, with thermometer at 40° above zero, while the Weston boiler engine run during a heavy snow storm with thermometer down to zero.

## REPORT OF THE WESTON-BOILER ENGINE NO. 417, March 4, 1873.

From Chicago to Elkhart, 100 miles, with 31 freight cars, 30 of them loaded. Left at 10 a. m.; arrived at 10 p. m.

Time on road, 15 hours. The weather extremely cold, with thermometer at zero, and very strong head wind. The engine consumed 8,943 lbs. of coal in the run of 100 miles, using no wood, making 89.43 lbs. of coal per mile run.

Coal used per 1 mile run.....89.43  
Add to equal the coal used by the ordinary boiler engine (19.73 per cent.).....17.63

Total.....107.06

The ordinary-boiler engine used this trip 19.73 per cent. more coal than the Weston-boiler engine.

The dynamometer placed between the tender and the train for the purpose of showing which was the heaviest train, or the amount of resistance overcome by each engine, gave to the Weston boiler engine on starting train at Chicago 13,000 lbs.; and it gave to the ordinary-boiler engine on starting train at Chicago 13,200 lbs., so that we may consider the number of cars hauled and the weight of the train on these trips as about equal and alike.

The Weston-boiler engine hauled the 31 cars with the thermometer at zero, and in the face of a strong head wind, and being obliged to wait longer on side tracks for passing trains, she was on the road and under fire two and a half hours longer than the competing engine.

The ordinary-boiler engine hauled the 31 cars in pleasant weather with the thermometer 40° above zero, and meeting with less detention from passing trains, was under fire two and a half hours less.

The Weston-boiler engine saved in this trial direct 19.72 per cent. of coal. What additional per cent. of saving should be accredited to her on account of the difference in weather, the violent head winds, and the longer time under fire, is a matter of conjecture; but it is safe to conclude that had the weather and other conditions been equal, the Weston boiler engine would have demonstrated a direct saving in fuel, over the ordinary-boiler engine, of from 30 to 40 per cent.

## COMPARISON BETWEEN A WESTON-BOILER ENGINE AND A MASON ENGINE WITH ORDINARY BOILER.

Weston Engine No. 417, March 4, 1873.

From Chicago to Elkhart, 100 miles, with 31 freight cars, 30 of them loaded. Left at 10 a. m.; arrived at 10 p. m.

Time on Road, 15 hours. The weather extremely cold, thermometer at zero, and very strong head wind.

The engine consumed 8,943 lbs. of coal in the run of 100 miles, using no wood, making 89.43 lbs. of coal per mile run.

Coal used per mile run.....89.43  
Add to equal the coal used by the Mason engine, 10.15 per cent..... 9.07

98.50

The ordinary-boiler Mason engine used on this trip 10.15 per cent. more coal than the Weston-boiler engine. The Weston-boiler engine hauled the 31 cars with thermometer at zero, and in the face of a very strong head wind, and being also obliged to wait longer on side tracks for passing trains was on the road and under fire four hours longer than the Mason engine. The Mason engine hauled the 31 cars in pleasant weather, no wind, and thermometer at 40° above zero, and meeting with less detention from passing trains was on the road and under fire four hours less. The number of cars and weight of trains were about equal, but considering that the Weston-boiler engine was under fire four hours longer than her competitor, and that she hauled her train in the face of a strong head wind, with thermometer at zero, against the Mason engine hauling the same number of cars in pleasant weather, no wind, and thermometer at 40° above zero, it is clear that had the weather and other conditions been the same on both runs, the Weston-boiler engine would have shown a direct saving in fuel of over one-third, or greater than is claimed for the boiler by the Weston Boiler Company.

## COMPARISON BETWEEN A WESTON-BOILER ENGINE AND A MASON ENGINE WITH THE ORDINARY BOILER.

Weston Engine No. 417, March 3, 1873.

From Elkhart to Chicago, 100 miles, with 34 freight cars, 19 of them loaded. Left at 9 a. m.; arrived at 9 p. m.

Time on Road, 18 hours. The weather extremely cold, thermometer at zero, heavy snow storm prevailing. The engine consumed 8,709 lbs. of coal in the run of 100 miles, using no wood.

Coal used per 1 mile run.....87.09  
Add to equal the coal used by the Weston-boiler engine 18.79 per cent. .... 16.36

Total.....103.45

The ordinary-boiler Mason engine used on this trip 18.79 per cent. more coal than the Weston boiler engine.

The dynamometer placed between the tender and train for the purpose of showing which was the heaviest train, or to show the resistance overcome by each engine on starting from

On starting at Elkhart.....13,500  
" South Bend.....12,500  
" Running.....10,000  
" Carlisle.....13,000  
" Running.....11,500  
" Laporte.....7,700  
" Running.....12,000

Total.....71,100

Add to equal the extra weight of train or to equal the extra resistance overcome by the Weston boiler engine, 25.18 per cent.....17,900

Total.....89,000

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tracks caused a consumption of coal by the Weston-boiler engine—while waiting under fire and in the extra coal used to replenish the fire on starting—fully equal to the consumption of coal during same length of time while running; and, had passing trains permitted the Weston-boiler engine to have made the 100 miles in 12 hours, the same as the Mason engine, her consumption of coal would have been, doubtless, 33 per cent.—or say one-third—less than was used by the Mason engine.

The dynamometer registered as follows:

On starting at Elkhart.....13,500  
" South Bend.....12,500  
" Running.....10,000  
" Carlisle.....14,000  
" Running.....13,000  
" Laporte.....12,500  
" Running.....13,500

On starting at Elkhart.....11,000  
" South Bend.....7,900  
" Running.....7,500  
" Carlisle.....9,500  
" Running.....11,900  
" Laporte.....8,500  
" Running.....10,500

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## Editorial Announcements.

**Removals.**—The Chicago office of the RAILROAD GAZETTE has been removed to No. 77 Jackson street, opposite Third avenue.  
The New York office of the RAILROAD GAZETTE is removed to Room 131, No. 73 Broadway, opposite the upper elevator landing.

**Correspondence.**—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

**Articles.**—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

**Inventions.**—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

## EXPERIMENTS.

It is somewhat surprising, considering the immense pecuniary interests involved, that so few carefully conducted experiments are made and recorded to elucidate the principles involved in the various departments of railroad operation. It will require but very superficial investigation to show that in many directions our knowledge is exceedingly limited, and that it will remain so until some carefully and intelligently conducted experiments are made to determine with scientific accuracy the points in doubt or dispute. This is true not only of questions which are interesting because of the scientific principles involved, but it is also true of many of immediate and very great practical importance, involving large and constant expenditures, which latter, there is good reason for believing, might be very much diminished by careful and intelligent investigation by experiment and otherwise. There is, in fact, hardly any department of railroad operation of which this is not true, and there is reason for believing that the era of a large-minded and wise economy in the management of railroads is near at hand. Heretofore scheming has often been more profitable than economy; but the clamor and discontent the country over about the cost of transportation will be certain ultimately to effect whatever popular pressure can in securing lower rates. Besides this cause, competition among rival lines also helps to reduce rates and enforce more economical management. Their tendency, judging by past experience, as has been shown heretofore in these pages, is in a downward direction. There is no reason for believing that this tendency will be checked. It is, therefore, we believe, certain that events will compel railroad managers to study economy, and that probably the sense of justice of all observant people will be gratified by seeing that railroads which employ and recognize the value of intelligence will be profitable, while those whose managers are blinded by ignorance will not be.

These reflections were suggested by recalling that at nearly every convention of the Master Mechanics' Association

it has been suggested or proposed that some system should be adopted by which experiments could be made to elucidate the obscure questions which are presented, from time to time, by the experience and practice of master mechanics. Last year Mr. Robinson, of the Great Western Railway of Canada, presented the question in the following remarks:

"During the meeting of our Committee yesterday, we had a very long and warm discussion on the subject of a fund belonging to this Association for the trying of experiments, but we could make very little headway with it, because we did not know what the general opinion would be in regard to this subject. I might go on and explain for half an hour the many vexed questions which worry and annoy railroad superintendents and master mechanics every day of their lives; the innumerable patents which are brought to their notice, the merits of which it is very difficult to discover, and also the various improvements which require an actual test before any truthful result can be ascertained, but the cost would be too great for one road to undertake. The gist of the whole thing is this: That it seems a great waste of money and brains that every road should try each of these experiments, starting at the same point and coming to the same result. It seems to me, if some plan could be devised by which the railroads should appropriate a certain sum, in proportion to their capital or mileage, the master mechanics could each year at this convention put these experiments into the hands of committees, and some good result would follow. The ideas conveyed to our minds were such that we did not feel that we were in a position to make any recommendation; but it is a matter well worthy the consideration of this convention as a great saving of labor and brain work."

We have quoted Mr. Robinson's remarks entire, because they are a very concise statement of thoughts which other members entertain, and which have thus far not taken distinct form or found public expression.

There can be no doubt of the value which properly conducted experiments would have to railroad companies. If in the consumption of fuel alone, an economy of 10 per cent. could be achieved by experiments leading to a better proportion of furnace, boiler and other parts, which we believe to be quite possible, it would compensate for almost any expenditure which could be made in experiments. The purification of water is another collateral subject, quite susceptible of being elucidated by experiment. The strength of drilled and punched boiler plates, which excited so much discussion last year, is another which a comparatively small expense would determine, but which is now involved in much doubt. Of the resistance of trains we know comparatively little; the weight of rolling stock and the proportions are well worthy of the most painstaking and careful study. The relative proportion of weight and form of the wheels and rails is also deserving of inquiry. The strength of materials, the quality of paints and oils, the condition of the atmosphere in cars, and the efficiency of ventilation, are all subjects about which we know comparatively little. The new systems of continuous atmospheric and other train brakes, electric signals, and numerous inventions which are constantly being presented, are legitimate subjects for experiment.

Considering therefore the immense advantages which would be almost certain to result from experiments carefully made, it is not surprising that attention has been called to the importance of making them. The fact, however, that no plan has been proposed for putting these suggestions into practice indicates that there is some difficulty in the way, the nature of which a little reflection will indicate.

Experiments, to have any value, must be made by persons of considerably more than ordinary intelligence. They must have patience, love of truth, entire honesty, ingenuity in expedients, extensive experience, a liberal amount of scientific knowledge, and, above all, the power to reason logically and deduce sound conclusions from a great variety of facts. Very frequently the value of experiments will depend almost entirely upon the time and patience which are expended in making them. Their scope will extend and ramify as they progress, and one thing will suggest another, and each successive step will require new proof. Now if the Master Mechanics' Association should undertake through its committees to make any experimental investigations, it would at once encounter the difficulty of finding men who could give the requisite time and at the same time have the requisite qualifications for such work. Suppose, for example, that a committee of three who are actively engaged in these occupations were selected to experiment on the proper proportions of cylinders and driving wheels to locomotive boilers (a still undecided question), where could three men be found who could give weeks to making experimental investigations? Without giving a great deal of time and care to them, the investigations would not be likely to have much value. Without in any way intending to disparage the abilities of the members of the Association referred to, it may be assumed, too, that a comparatively small proportion of them have the special qualifications which are required for making such investigations. It is not at all certain that the man who can manage the machinery department of a road most successfully and economically would be equally efficient in tracing up the truth which is hidden under a mass of complicated facts and what sometimes appear to be contradictory phenomena. In the management of men a

master mechanic must of necessity become somewhat arbitrary, as nothing is so fatal to the control of men as indecision. Just the reverse traits are needed when we are trying to discover the truth, which can be won only by the most gentle measures and the most impartial justice. There are, we know, in that Association men who, if they could devote their time to investigations of the kind we have described, would be equally or possibly more successful in the field which we have described than they are in their present duties; but to be so they would need to give their best time and thoughts to such work, which is now impossible.

The primary difficulty, therefore, in carrying out any comprehensive system of experiments consists in getting men with the requisite time and ability to make them. If it could once be shown that persons who are properly qualified would devote themselves to investigations of this kind, there would probably be very little difficulty in procuring the requisite money needed for the purpose.

At present there is also another difficulty in the way when a master mechanic undertakes to experiment in any given direction. We refer to the want of instruments, many of which are very expensive and others exceedingly delicate and requiring considerable skill in their use. If it is desired to determine the strength of boiler plates or riveted seams, few master mechanics would feel justified in making a requisition for a testing machine costing several thousands of dollars. If intending to apply an indicator to the cylinders of a locomotive, most master mechanics find themselves without experience in its use. So of many other investigations. In fact, to clear away the doubts or to answer all the questions which arise in a master mechanic's experience would require an expenditure of many thousands of dollars in instruments, and probably the entire time of the person making them. Now, as Mr. Robinson has very justly remarked, "it would be a great waste of money and brains if every road should try each of these experiments." If now all the roads in the country could cooperate and share the expense of making them, it would obviously result in great economy to all parties concerned.

In order to accomplish this, it has been suggested that the Master Mechanics' Association should establish what, for want of a better name, may be called a "mechanical laboratory"—that is, a place equipped with the best instruments for making such experiments as it may be desirable to try. The instruments needed are such as testing machines for determining the tensile, compressive and torsional resistance of metals and other materials; machines for determining the hardness and density of rails, and their capacity to resist a blow from a falling weight; tests for lubricators, paints, oils and varnishes; steam-engine indicators; models for testing valve gear; dynamometers and speed indicators; thermometers and pyrometers; chemical apparatus, etc., etc. The instruments could be placed in the care of some person competent to learn their use and apply them, and instruct others how to use them, and they would then be at the service of any of the members inclined to use them at any time. By this arrangement any member of the Association could make any experiments he might desire in the laboratory, and have the assistance of a competent person skilled in the use of and familiar with the instruments and their application. His services could also be available for making experiments with any of the portable instruments required on the line of any road. The apparatus, if placed in charge of a competent person, would be kept in good condition, so that it would be available when needed.

Judging from the liberality of the friends of the Association, as manifested in the entertainments given to the members in Philadelphia, Boston, and to be given this year in New York, there is every reason for believing that if a request were made in the right form an equal or greater liberality would be shown, if it were known that the money was to be devoted to scientific inquiry. It seems probable, too, that if this matter were presented to railroad managers in a practical form, which would indicate that money devoted to the purpose would be applied to the objects aimed at without danger of being squandered uselessly, they would contribute liberally. Surely there are enough undetermined questions of practical importance to justify the expenditure of at least a comparatively small sum on experiments to shed light on the disputed points.

In order to be successful, a movement of this kind must be put in a practical and definite form. The Association must state clearly and concisely what they propose to do, and how they intend to go to work to do it. Railroad managers are usually very shrewd business men, and will see a flaw or practical weakness in any scheme proposed sooner than almost any other class of people.

Should any steps be taken to establish such an experimental laboratory as we have suggested, the title to the property should be vested in a board of trustees consisting



ing of a number of railroad presidents and managers. The management of it might be in charge of a committee of the members, and the immediate care be given to one or more competent persons.

#### ASSOCIATIONS OF MANAGERS.

The executive officers of railroad companies have facilities for making investigations of questions relating to their business such as are within the reach of very few men of any occupation. They have more or less under their control immense organizations, trained bodies of men, and experts in the various specialties of their business. Most railroads have a business so extensive that inductions from the experiences of a single line, if carefully recorded, in many important matters may be quite conclusive. To establish principles in agriculture and ordinary manufactures usually requires the combined experience of many establishments, because one does not furnish instances enough or sufficiently varied to give a basis for safe inductions.

Still, we fear that with all their facilities for independent and thorough investigation, these railroad officers are below rather than above the average of men in habits of investigation and the search for principles. Their negligence, it is true, may in part be apparent rather than real, and for the very reason that all the materials are in their own hands: each man may study for himself in his own field, and count the results of his study purely his own or his company's, to be concealed rather than made known. Doubtless a great many questions may be thus satisfactorily settled by experiments on a single line, and in such cases the regret is chiefly for the waste of time in repeated experiments to determine questions already settled, and for the bad working of lines whose managers can not or will not search for improvements, but continue in the beaten track until another is beaten for them.

It is, perhaps, natural that executives should neglect investigations. Their recognized business is to act and not to discover. The patient experiments, careful records and painstaking conclusions which are the habits of the professional investigator are not at all the habits of the railroad superintendent and manager, who cannot often ponder long over the questions referred to him, and usually must decide on the moment. By organization, however, the proper machinery for the needed investigations may be provided, and then a proper sense of their importance and patience in waiting for results should be sufficient to keep that machinery profitably in motion and productive of results.

The Railway Association of America has two main objects which are quite distinct: one the decision of questions which require the agreement of different companies—of common policies and methods of working; the other the study of railroad management. The first requires action, and combined action; the second simply investigations, reports and discussions. The first can be effective only when the final power, whatever that may be, of the railroad companies, unites in or consents to the agreements. The second may be pursued with advantage by nearly all men of experience in working railroads, even if they have no authority to bind their companies to pursue any special policy. To attain the first object with complete success it will be necessary that delegated powers from all the companies, or all the more important ones, should take part in the decisions of the Association, or accept its decisions. The latter object may be pursued with great profit by a little knot of men, and with success proportioned to their intelligence, enthusiasm and experience, rather than to their number and authority. "A Uniform System of National Time for Working Time-Tables" is one of the subjects to be reported upon at the meeting next week. Now it will be easy enough for the Association, or a few members of it, to discuss this subject, to ascertain the possibility and propriety of a uniform time, and to develop a scheme for adoption; but to *adopt* it will require the unanimous consent of authorities, or of so large a part of them as to make it inconvenient for the other companies to refuse it. So with the question of paying commissions on ticket sales. The practice can be abolished only by unanimous action; but its evil effects, the desirability of abolishing it, and the steps to be taken in the event of its abolition, can be pretty well settled by discussion among a small number of managers.

Now there is a danger that railroad officers, accustomed to rapid discussions and quick results, may consider the Association a failure unless at once its deliberations result in united action and the consequent abatement of certain long standing and generally acknowledged abuses. That is, they are generally apt not to appreciate sufficiently the value of those investigations and deliberations which must in any case precede wise united action, and in very many cases may give a foundation for independent action of the highest value. The discussion of

train dispatching may not result in the adoption of a uniform system; it may not be desirable that it should; but it may well result in important reforms on many lines, and a consequent increase in safety and economy on these lines. And even if results are not reached immediately on any line, the increase and diffusion of information which cannot fail to result from any fairly careful reports and their discussion will be at least a step toward improvement. A society such as this can hardly effect a revolutionary or any considerable change from the beginning. Besides its own youthfulness, and the non-existence of a habit of discussion, if not of investigation, among its members, it has to meet the further great obstacle of a lack of precedents. It works in a new field, and must explore for itself and determine its own paths. Railroad transportation is the occupation of a very large number of men, including many of great ability; but it can hardly be said to have a literature, and if one would inquire what experiments have been tried before him and the results of various policies, he must apply to the managers themselves, or content himself with the meager information contained in companies' reports and the statistics collected by some governments, which usually do not even touch upon many questions of operation and management of the greatest importance. But this difficulty of a lack of information is precisely one of the chief reasons for the existence of an association of managers and for a general attendance by those qualified for membership, and their attention to the investigations and discussions which it proposes. The Association may easily do a work of extraordinary value, immediate and remote, but only by the general co-operation of the men who manage and work railroads.

The next meeting, to be held on Wednesday and Thursday of next week, is to hear and discuss reports on ten subjects of general importance and interest. One would think that the simple interchange of opinions of no more than ten or twelve capable managers on some of these subjects would be so interesting that all would make an effort to hear it. As at the same time there will be an opportunity to decide some questions of importance affecting all the railroads, as well as to give a lasting impulse to the Association in a career of great usefulness, there seems good reason to hope and expect a large attendance of the best men.

#### "Train Speeds on Future Trunk Freight Lines."

This is the title of an article by Mr. Russell Sage, Jr., published in the May number of *Van Nostrand's Engineering Magazine*. It has been asserted and generally believed that to carry at the least possible cost we must carry at low speeds; and the plans for railroads to carry freight exclusively have usually limited the speed of trains to ten miles or less per hour. Mr. Sage questions this principle, and proceeds to make calculations of the amounts of rolling stock, number of train-men, etc., required to carry a given traffic at five, ten and twenty miles per hour. This was a work which needed to be done; but all of Mr. Sage's results are vitiated by the extraordinary assumption that the same power will be required to haul trains of equal weight at any rate of speed! So he makes twenty-five cars the load of an engine at five miles an hour, and also at ten and twenty miles, on the principle, apparently, that a horse can draw a plow on a run as easily as on a walk. Mr. Sage seems not to have borne in mind that power = mass into velocity; at least he has left velocity entirely out of account in his calculations.

Now not only must the load be diminished with the velocity, but, as is well known, it must be diminished at a greater rate than the velocity, the resistance in pounds per ton being estimated at 8.146 lbs. at 5 miles per hour, 8.585 lbs. at 10 miles per hour, and 10.239 at 20 miles per hour, so that the expenditure of power to haul trains any given distance at these different speeds will vary as these numbers. Having a fixed engine power, the maximum load will be equal to that power divided by the resistance at the speed adopted multiplied by the velocity, or engine-power = resistance at given speed  $\times$  velocity  $\times$  train load. So if we take Mr. Sage's train of 25 cars at 20 miles an hour, assuming the loaded cars to weigh 20 tons each, we have the engine power =  $10.239 \text{ lbs.} \times 20 \times (20 \times 25) = 102,390 \text{ lbs.}$  To find the train-load at 10 miles an hour we must divide this last number by  $10 \times 8.585 \text{ lbs.}$ , or 85.85, which gives us 59.63 cars. For the speed of 5 miles per hour, we divide 102,390 by  $(20 \times 40.73)$ , or 5,119 by 40.73, which gives us something more than 125 cars for the equivalent train. We are not going to recommend such trains, but these would be, theoretically, the equivalents of a train of 25 cars at 20 miles an hour, by which it appears that a decrease from 20 to 10 miles per hour enable us to add 136 per cent. to the number of cars hauled, and a decrease from 20 to 5 miles per hour gives the engine ability to haul five times as many cars.

This makes sad work with Mr. Sage's estimates. He gives the following example:

"At 5 miles per hour.—Half-hourly trains will run at intervals of 24 miles. For this speed we will run our locomotives similarly to our cars, viz.: 20 hours or 100 miles on the road and 8 hours off—severe as to hours but not as to miles. Each car and locomotive will make 100 miles every 28 hours, or 313 trips annually—a total of 31,300 annual miles in 6,260 working hours on the road and 2,500 hours in yard or house. Each train-man will run 50 miles every 20 hours, and 21,900 miles annually—small as to miles, but it represents 12 hours on duty and in motion out of every 24, day in and day out. We shall

have 40 trains each way constantly on the road, and 16 trains constantly at each terminus; and shall require daily to just do our work:

2,800 freight cars.	112 locomotives,
160 cabooses (if each conductor has his own),	160 conductors,
160 enginemen,	160 firemen,
	320 brakemen."

Now as these estimates are for the amount of work which would be done by trains of 25 cars running 20 miles an hour, we must divide the number of cars (2,800) by 125 instead of 25, to get the number of trains, engines and trainmen depending on the number of trains and not on their length—that is all named except brakemen. Then we shall have instead of his table:

2,800 freight cars.	23 locomotives.
32 cabooses.	32 conductors.
32 enginemen.	32 firemen.
	320 brakemen.

This is a distinction with a difference indeed, and here we have allowed too many brakemen, who should indeed be more numerous for a long freight train, but not directly in proportion to the number of cars. Of course our trains will not be half-hourly; one every two and a half hours will do the work. We might extend these corrections to the tables given for trains at 10 miles an hour, but the fallacy is sufficiently obvious.

So far as the tractive power of locomotives is concerned, the same engine will effect a tonnage or car mileage 18 per cent. greater at 10 miles an hour than at 20, and 25 per cent. greater at 5 miles than at 20 miles an hour. The expenses for engine service and fuel per train mile would be nearly the same, the locomotive repairs less, the car expenses less for each but greater in the aggregate, the cost of brakemen greater per train mile. It is true that a very long train is unwieldy, and that one of 125 cars would be apt to pull to pieces the forward cars, and an engine built for high speed and light trains would not be likely to have adhesion enough. The practical limit of the size of trains at low speeds is a problem that deserves investigation, and, so far as we know, has not yet had it.

Mr. Sage's final comparison assumes to give the additional rolling stock, capital and annual interest and expenses needed at 10 miles an hour more than at 20, for a road 100 miles long, delivering 1,200 cars of freight at each terminus daily, as follows:

	Additional capital.	Additional interest and expenses.
500 freight cars, say at \$300.....	\$150,000	\$28,000
40 locomotives, say at \$14,000.....	560,000	39,200
40 cabooses, say at \$300.....	36,000	2,520
40 enginemen, say at \$1,200 per year.....	48,000	48,000
40 firemen, say at \$600 per year.....	24,000	24,000
40 conductors, say at \$300 per year.....	36,000	36,000
80 brakemen, say at \$540 per year.....	43,200	43,200
Total.....	\$996,000	\$220,920

Making the corrections for Mr. Sage's error, we would have nine less locomotives, cabooses, enginemen, firemen, and conductors, instead of 40 more of each; and this will make the capital for locomotives and cabooses \$134,100 less, instead of \$596,000 more, and a decrease in the interest account of \$9,387 on the account of these, instead of an increase of \$41,720, besides a decrease of \$24,400 on account of services for which Mr. Sage has added \$108,000. Correcting his table we have:

Additional capital.....	\$265,900
Additional interest and wages.....	37,713

which is something, truly, but very far from the \$996,000 additional capital and \$220,920 additional annual expenses given by Mr. Sage.

We would not give our figures as conclusive, by any means; for, as we have said, other elements than the power of locomotives are likely to limit the length of trains at low speeds. Evidently the cost of train service may be reduced by increasing the size of the train or its velocity; both of these are limited by the power and weight of locomotives, and we seem to have reached nearly the limit of weight of the latter with the present permanent way. When experience shall have taught us the practical limit to the length of trains, it will be comparatively easy to estimate the comparative cost of transportation at different speeds; but it is to be hoped that the investigator will not then drop velocity from his equation.

#### Entertainments to Master Mechanics.

We regret to learn that some of our remarks in last week's paper headed "The Coming Conventions" have caused considerable misapprehension regarding their intended application, and that they were supposed to be aimed at some of the preparations which are being made to entertain the members publicly, both here and in Baltimore.

We believe that if our article is read carefully it will be seen that it was not intended to apply to any public entertainment, but that the practice which we condemned was that of private parties turning their apartments, in the hotel selected by the master mechanics, into public bar-rooms, and thus bringing discredit on all about them. If anything more which we could say would make our condemnation of this practice still stronger, we should try to put it in as plain words as possible.

We have frequently taken occasion to point out the injustice which is done to the members of the Association referred to by assuming that, because they have a certain amount of social and convivial enjoyment at their annual meetings, therefore the other proceedings of their Society can have no value. Nearly all railroad officers in this country are obliged to incur the danger to which overwork exposes them. Surely the recreation which the week of absence at the annual session of their Association gives master mechanics is none too much to enable them to recover the elasticity which long tension is so very apt to take out of their and all our bodies and minds. The pleasant excitement of public dinners, excursions and journeys serves the same purpose to them that retempering does to locomotive springs. It makes them better able to bear the loads they must carry. There are men who can never contemplate any of their kind enjoying themselves without envy and ill feeling. This propensity has been exercised against the



Master Mechanics' Association and has done it much injustice. The members have been entertained wherever they have held their meetings, but especially at Philadelphia and Boston, in an almost princely style. Some who have heard of it, forgetting or not caring for the more serious work of their meetings, have very maliciously reported that the chief and, in fact, only object of their meetings is "having a good time," which is not true; and if it were, so long as their enjoyment is of a reasonable kind, could work no harm unless other things more important were sacrificed to it.

When, however, an unlimited supply of intoxicating drink is furnished in a somewhat indiscriminate assemblage of people, such as come together at the annual convention, and who, many of them, feel no responsibility for what is done, nor are subject to the restraint which a public entertainment imposes, the practice is almost sure to result in scenes which are very discreditable to all, even to those who take no part in them, and from which the whole Association suffers. If those who propose to entertain the master mechanics have the true interests of the Association at heart, as we believe they have, they will do all in their power to prevent parties from doing what we have condemned and will continue to condemn. In doing so we believe we have the sympathies of a large majority of the members, and we trust, of those who have found fault with what we have said.

This is not the place, nor is it our purpose or wish, to deliver a temperance lecture; but it is the place and it is our duty to criticize and condemn practices which work evil to the Association and to the members of it. We regret that our perhaps somewhat careless phraseology was capable of the construction which was imputed to it, and which we certainly did not intend it to convey.

#### Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of track on new railroads as follows:

*Chicago & Pacific.*—Opened for business to Roselle, 21 miles east by north from Chicago, and 3 miles beyond the recent terminus. *Burlington & Southwestern.*—Extended from Cincinnati, Iowa, southwestward 7 miles to the Missouri line. *Cairo & St. Louis.*—The track of this narrow-gauge road has been extended southward 11 miles to a point seven miles south of Sparta, Ill. *Wisconsin Valley.*—Track laid from Tomah, Wis., northward 17 miles. *New Haven, Middletown & Willimantic.*—Completed by laying track on a section 6 miles long between East Hampton and Turnerville, Conn. *Indiana & Illinois Central.*—Completed from Montezuma, Ind., on the Wabash River, westward about 30 miles to the east line of Douglas County, Ill., where it connects with a section completed last year. *Southwestern of Georgia—Blakely Extension.*—Track laid from Albany west by north 23 miles to Leary's, Ga. *Texas & Pacific.*—Track laid from Dallas, Texas, eastward 20 miles to Mesquite River.

This is a total of 31½ miles of new railroad.

#### Annual Conventions.

The following societies will hold their annual conventions at the time and places named:

The American Railway Master Mechanics' Association, in Baltimore, beginning May 13.

The Railway Association of America, at the St. Nicholas Hotel, in New York, on the 14th and 15th of May.

The American Society of Civil Engineers, on the 21st and 22d of May, in Louisville.

The Master Car Builders' Association, on the 11th, 12th and 13th of June, in Boston.

Particular attention is called to the Master Mechanics' meeting, which we have heretofore announced as beginning May 6, as was announced also on the cover of the report of the last convention.

THE RICHMOND SWITCH ACCIDENT has been investigated by the Railroad Commissioners of Rhode Island, and the testimony reported has given the evidence needed, as we said last week, to determine whether and how far the company's negligence was the cause of the accident. The train-men, the Superintendent, the bridge repairer, the mill-owner, the miller, the switchman at Richmond, and a manufacturer who examined the dam after the accident were examined, and there was no disagreement in their testimony. The bridge abutments were built in 1834 or 1835, and the strength of the structure and the channel were considered ample—as indeed they had served for nearly forty years. It had been examined by an expert a fortnight before. It was not built below the dam, but the dam was built above it, twenty-three or four years after the bridge was constructed. The water was high, but not higher than it had been before frequently, and no danger was apprehended by any connected with the mill. The mill men examined the dam the day before the accident, and the switchman passed over it about ten hours before the accident, and saw the water running through the waste gate, and at night the gate was left wide open and the wheel gagged. A manufacturer who had had much experience with dams declared the part which remained to be amply strong. The mill owner felt sure that the dam had been tampered with; the manufacturer who examined the bridge said: "I have learned not to allow the water to rise above the frost line when the ground is settling in spring, as before the ground thoroughly settles, it is porous and the water easily finds a passage through it. This may not have been the cause of the break, but if it was not I cannot think what else to attribute it to, as the portion of the dam that remains is certainly amply strong."

This evidence clears away a number of reports which have been widely circulated concerning the condition of the dam. There seems to have been no reason for any greater care than is needed at all seasons of high water. The company seems

more to blame for an accident which did not occur than for the one which did; for it has no telegraph offices open at night at way stations, and in this case if the train-men had all lost their lives or their wits by the accident, the mail train following close would almost surely have followed the steamboat train into the stream, and crushed the remnants of its wreck. The prompt action of the conductor, who sent back a danger signal before he had fairly recovered his feet, may have prevented a second accident.

THE MEXICAN RAILWAY, now in operation between Vera Cruz and Mexico, 263½ miles, has 26 intermediate stations, or about one station in every nine miles on the average, the longest interval between stations being 19 miles. There is one passenger train running through, which leaves Vera Cruz at the very unreasonable hour of 3 a. m., and reaches Mexico at 9 p. m. of the same day—not quite 15 miles an hour. Returning, it leaves Mexico at midnight and reaches Vera Cruz at 5:40 p. m.—nearly at the same rate as the trip up, which for some distance is up with a vengeance. There is also one freight train daily, which also takes passengers and makes the trip in 29 hours—laying over all night (from half-past nine till half-past five down and from seven to 4:45 up) at a station on the way. The passenger on the trip up has ten minutes about half-past four in the morning, ten minutes an hour later, ten minutes half an hour later, ten minutes an hour later, 15 minutes about nine o'clock, ten minutes an hour and a half later, 45 minutes about one o'clock, 15 minutes at half-past four, and ten minutes an hour later, for refreshments, or other purposes, so that in this trip of 263 miles he waits at stations two hours and a quarter, besides the stops of less than ten minutes. Perhaps Mexicans need a great deal of "refreshing," and perhaps it is intended to give commercial travelers and others opportunities to do business and make visits at all the principal stations on one trip.

Besides the through passenger and freight, there is what is known as a "pulque" train running between Mexico and Soitepec, 112 miles. Pulque, as some of our readers may not know, is the Mexican whiskey.

THE LEGALITY OF MUNICIPAL AID TO RAILROADS was passed upon recently by the United States Supreme Court in a case between the Sheboygan & Fond du Lac Railroad Company and the County of Fond du Lac. In this case the Wisconsin Legislature had authorized the county to vote aid and raise taxes to aid the railroad. This act of the Legislature was declared unconstitutional by the Supreme Court of the State on the ground, not of any special constitutional prohibition, but of the general principle that taxes may be levied only for public purposes, and that the construction of a railroad is not a public purpose. The United States Supreme Court refused to be bound by this decision, holding it not to be an interpretation of the State constitution (in which case it would have been final), but only of the question whether the building of a railroad by a private corporation may be, and in this case was, a public purpose. It decides that it is a public purpose. "Though the ownership is private, the use is public." "In their very nature they are public highways." This decision will cover all cases in all States where taxation in aid of railroads has been declared illegal on the ground that it is not for a public purpose.

THE EFFECT OF SEVERE WEATHER ON TRAIN EXPENSES was strikingly illustrated on the Great Western of Canada last January. Mr. Robinson, the Locomotive Superintendent, reports that while the time-table called for 12,069 hours of locomotive service on freight trains during that month, the freight locomotives were actually under steam 18,379 hours! This increase of 50 per cent. must have extended, or nearly to the same extent, to fuel consumption, locomotive and train service, and to repairs probably in a greater proportion.

#### NEW PUBLICATIONS.

*Travaux Publics des Etats-Unis d'Amérique en 1870: Rapport de mission par M. Malezieux, Ingenieur en chef, Professor a l'Ecole Nationale des Ponts et Chaussées. Publie par ordre de M. le Ministre des Travaux Publics, Paris; Dunod; 1873.\**—On the 9th of May, 1870, the French Minister of Public Works decided that one of the engineers of the Corps of Ponts et Chaussées should be sent to the United States to report upon our public works, such as railroads, bridges, canals, water works, harbors, etc., and M. E. Malezieux was accordingly dispatched. He arrived in New York on the 27th June, and sailed again from that port on the 5th of October, having been one hundred days in America. In that time he picked up from various sources and from personal observation enough matter to fill a solid quarto volume of 572 pages, accompanied by an atlas of 61 plates 10 x 16 inches, beautifully engraved in that style which makes American engineers envy their French brethren.

As to the value of the matter contained in M. Malezieux's book, we shall here say that we believe that it will be a textbook for American as well as European engineers, as the best existing collection of illustrations of American engineering. It admirably supplies a want which has existed, and we hope that it will be translated into English for the benefit of those who are not familiar with the French language. M. Malezieux, of course, came well introduced, and he was able to collect authentic reports and descriptions of what he saw, wherever such existed; and where they did not, he has shown himself well able to describe from personal examination.

He went as far north as Montreal, then went to Niagara and Chicago, thence to San Francisco, and back via St. Louis, Cin-

\*Public Works of the United States of America in 1870. Report of the mission by M. Malezieux, Chief Engineer, Professor in the National School of Bridges and Roads. Published by order of the Minister of Public Works. Paris; Dunod; 1873.

cinnati and Philadelphia. He also visited the mining regions of Pennsylvania and went as far south as Weldon, N. C.

It would be impossible in the limits of a newspaper notice to give a description of this comprehensive work, and we shall content ourselves with an extract or two, which will give some idea of the style of the work.

M. Malezieux devotes a considerable part of his work to iron bridges, and, in comparing American with European types, he says, p. 120:

"Lattice girders, invented by Mr. Town, which answer so well for temporary works, and which Europe has generally adopted for her great railway bridges in substituting metal for wood, are no longer used in the United States. They have been substituted for them girders or trusses with large intersections, whose characteristic elements, it seems to us, can be grouped in the following formula:

"One little chord of hollow beams of from three to four metres long, united by cast-iron boxes, and the other chord of eye-bars pinned together, are united into one by braces and cross bars differently arranged, always jointed on the lower chord, and sometimes upon the other, in such a manner that each of these parts only sustains one kind of stress, tension or compression, whose calculated maximum determines the transverse section that should be given to each piece.

"Economy is not the only advantage. We can recognize others in the little surface exposed to rust by the metal concentrated along the lines of strains, in the facility with which we can get at all the parts to repaint them at the proper time, in the rapidity of erection of these parts which separately are short, in the small surface which the large intersections offer to the winds, and the little snow they hold on their top surfaces. The economy gained becomes more remarkable as the span becomes greater. They easily leap over, by this system, spaces of from 60 to 100 metres, and as the result of a work emanating from Government engineers and officials, submitted to Congress, thanks to the progress of science in these later days, they can, without putting the railway companies to extraordinary expenses, maintain from 90 to 120 metres as the least spans over navigable channels, of railway bridges to be constructed over the Ohio River.

"These new iron bridges are not unknown in France, but they have not, perhaps, sufficiently fixed our attention. The almost exclusive preference which they have among a people as practical as the Americans, is a piece of instruction useful to meditate upon."

In another place he says, speaking of the different systems used in America:

"The relative merit of the different styles of metal trusses of large intersections has for us only a secondary interest. That which most concerns us is the economy which they present in contrast with the riveted lattice and other systems habitually used in Europe. We have seen that, according to the figures given by M. Merrill, and also by M. Clarke, a metallic truss bridge of single track, of a span of 60 metres, can be built with about two tons of metal per metre. It also appears that a bridge of 150 metres of double track can be constructed with 700 tons of iron. If it be true that the tubular bridge over Menia Straits, which has an opening of two metres, took 3,000 tons of metal, and that the bridge of 150 metres at Kulenberg, in Holland, took 2,125 tons, the contrast of these figures indicates that the great bridges which have been built for several years past in America have realized a considerable economy."

Such are the views of an intelligent and unprejudiced French engineer on the subject of American bridges. We hope that the extracts which we have made will awaken in American engineers a desire to become better acquainted with his admirable work.

#### Report of the Grand Trunk Railway of Canada.

The following is the chief part of the directors' report for the last half of 1872:

Dec. half of 1871.		Dec. half of 1872.
£935,341.....	The gross receipts upon the whole undertaking, including the Buffalo and Champlain lines, have been.....	£966,673
	Deduct:	
	The ordinary working expenses (being at the rate of 64.95 per cent., against 59.70 of the corresponding half of last year), £627,894	
	The renewals, etc., of the permanent way and works in the half year debited to revenue.....	165,399
712,724.....	revenue.....	798,283
£222,617.....	Leaving an available balance earned in the half year of.....	£173,885
43,540.....	Less amount of sundry expenditure as per revenue account.....	
£179,077.....		£173,885
15,183.....	Deduct loss on American currency.....	24,195
£160,894.....		£149,190
To this sum of.....		£149,190
has to be added the balance carried from the net revenue account of last half year of.....		1,653
Making a total balance of.....		£150,843
From this, however, has to be deducted the amount of postal and military revenue due for the half-year to the postal bondholders of.....		17,890
Leaving the balance of.....		£132,953
Applicable for the following payments, viz:		
Interest on hired cars.....		27,239
Interest, etc., paid on lands.....		21,505
Do. on mortgage to Bank of Upper Canada.....		4,424
Do. on temporary loans, bankers' balances, promissory notes, European exchange, etc.....		278
Do. on British American Land Company's debentures.....		980
Do. on Montreal Seminary debentures.....		616
Do. on Island Pond debentures.....		2,700
Half-yearly instalment on Portland sinking fund.....		2,568
Atlantic & St. Lawrence lease (in full).....		29,001
Detroit line lease (in full).....		11,250
Montreal & Champlain bond interest.....		12,081
Buffalo & Lake Huron rent.....		30,000
1st Equipment Bond interest.....		15,000
2d.....		15,000
Balance carried forward.....		30,000
		311
		£132,954

Comparing this half year with the corresponding period of 1871, the gross receipts show an increase of £31,337, or 3.35 per cent. There was an increase in the passenger receipts of £29,953, or 9.19 per cent., and in the freight receipts of £1,349, or 0.23 per cent. The total number of passengers carried was 984,525 against 961,432, and the quantity of freight was 797,935 against 789,231 tons. The average receipt per passenger was 6s. 6d. against 6s. 1d., and per ton of freight 15s. 4d. against 15s. 5d. The extraordinary severe weather which set in towards the end of December caused an actual decrease in the



traffic receipts for the last week of the year of nearly \$13,000, and the change of the gauge between Sarnia and Fort Erie, carried out last November, caused for a time a considerable interruption to the general traffic; and from these two causes the gross increase in the traffic was considerably less than it otherwise would have been. It will be seen, however, from the following table, that the steady growth of traffic to which reference has frequently been made in previous reports still continues, and that notwithstanding the exceptional causes referred to, a greater number of passengers and tons of freight were carried during the past six months than in any previous half-year:

Half year.	Nos.	PASSENGERS.		Tons.	FREIGHT.	
		Average per passenger.	s. d.		Average per ton.	s. d.
1872, Dec.	684,545	6	6	797,935	15	4
" June	738,748	6	5	737,361	16	3
1871, Dec.	561,432	6	1	789,331	15	5
" June	764,376	6	0	666,082	15	5
1870, Dec.	637,579	5	11	691,301	14	0
" June	700,334	6	5	612,959	14	6
1869, Dec.	592,697	6	3	611,809	15	7
" June	655,850	6	9	520,881	16	0
1868, Dec.	604,815	6	9	557,157	16	3
" June	619,398	6	9	505,957	16	1
1867, Dec.	794,213	6	10	587,227	15	4
" June	624,327	6	8	489,647	15	1
1866, Dec.	792,487	7	2	523,685	15	5
" June	638,708	7	0	497,292	15	4
1865, Dec.	784,316	7	2	521,830	15	5
" June	596,571	6	3	477,837	16	11
1864, Dec.	722,446	6	6	443,930	16	1
" June	523,284	6	0	430,034	16	3
1863, Dec.	629,783	6	5	372,984	15	1
" June	395,056	6	0	339,484	17	3

The expenses for the half year amounted, including the renewals as charged in the ordinary revenue account, to \$793,293, or 82.07 per cent. of the gross receipts; as against \$712,724, or 76.18 per cent. for the corresponding six months of 1871. Excluding the renewals, the ordinary working expenses were 64.95 per cent. against 59.70 per cent. There was an increase of expenditure for the half year of \$69,326—at the rate of 12.41 per cent., against an increase of 3.35 per cent. in the receipts. This additional expenditure was wholly due to the enhanced cost of fuel and other materials used in the working of the railway, and to a further rise in wages. The number of miles of permanent way relaid during the year was 236, of which 182½ miles were laid with steel. The total length of steel rails laid up to December 31 last was 291½ miles. The number of sleepers laid in during the year was 909,564, against 673,703 in 1871. The ballasting of a further length of 174 miles was completed. It will be observed that the total charge for maintenance and renewals in the past half year was for maintenance \$78,031, and for renewals \$193,138. In the previous half year the charges for these items were, for maintenance \$70,918, and for renewals \$76,780. The total charge for 1872 was therefore \$418,868. Of this amount, \$27,739, representing the cost of laying in the track 2,905 tons of steel rails with fittings, &c., has been brought to the debit of a supplemental account. This account has been opened for the purpose of charging it with the cost of the additional quantities of steel rails intended to be laid on the line beyond the 14,000 tons already arranged to be included as part of the ordinary maintenance and renewals of the railway during 1873 and 1874. This extra quantity will amount in the present and two following years to 32,000 tons. To the credit of this supplemental account has been placed the sum of \$282,737, a portion of the proceeds realized from the recent sale of the Atlantic bonds. It will be remarked from the engineer's report that the condition of the permanent way is more satisfactory than it has been for many years. The breakages of iron rails during 1872 have been 50 per cent. less than in 1871. The cost of maintenance will materially diminish as steel rails are further substituted for iron rails; and ultimately the total sum for maintenance and renewals, when the main line has been relaid with steel, will not, it is expected, amount to much more than one-half of the sums above charged. The total train miles run were 3,474,208, against 3,642,556, showing a decrease of 168,348 miles; and there was a decrease in the car mileage of 527,570 miles. The cost per train mile in the locomotive department was 32.14 cents against 26.40 cents. The increase in the item of fuel in this department was no less than \$21,237, and the increase in the wages amounted to \$5,701. These two items alone represent very nearly the increased cost of the working of the locomotive department in the half year. In regard to the charges for car hire, etc., it will be noticed that a large saving has been effected in consequence of the action taken by the President when he was in Canada last autumn, in terminating certain onerous agreements that were then in force, and had several years to run, for the use of changeable gauge car stock. The saving thus made will not be less than at the rate of \$50,000 a year. The total addition to capital during the six months was \$1,018,037, of which \$464,075 was the capitalized interest on the four classes of preference bonds and stocks, and \$346,926 was paid on account of the purchase of the Montreal & Champlain Railway, under the terms of the agreement made with that company. The other items, less certain credits, are chiefly for new works, the details of which will be found fully set forth in the accounts themselves. The receipts in American currency during the half-year amounted to \$2,439,000, as against \$2,357,000, of which \$1,101,554 was converted into gold, against \$956,599, entailing a loss of \$24,195 against \$18,183 for the corresponding period of 1871. Having regard to the future, the directors have to report that their bill now before the Canadian Parliament, containing the additional clauses adopted by the meeting held on the 20th of March last, has been approved by the Government in respect of the postponed and contingent Dominion debt of \$3,111,500, and that the Railway Committee of the Canadian House of Commons, to whom it was referred, has reported favorably upon it. As was announced at the meeting referred to, the contractors for the new issue of \$10,000,000 of ordinary stock have already deposited \$100,000; and they are bound to place a further sum of \$100,000 in the hands of the company within a fortnight after notice has been received of the passing of the bill. As soon as this last deposit has been paid, the company will be prepared on the request of the contractors to issue the new stock. A further sum of \$300,000 is then to be paid by the contractors within one calendar month from the date of payment of the last-mentioned \$100,000. The balance of \$1,500,000 is to be paid by the following six installments, viz., \$200,000 on the 30th September and the 31st December, 1873, and the 31st March, 1874, respectively, and \$300,000 on the 30th June, the 30th September, and the 31st December, 1874, respectively. The directors have as far as possible made preliminary arrangements—with a view to the narrowing of the gauge from Stamford to Montreal during the present year—for placing on the line, by the time the narrowing is effected, of 125 additional narrow-gauge engines—and for completing other important works in stations, sidings and ballasting; and they will be the better prepared, therefore, to give the necessary orders for the carrying out of the above improvements as soon as the bills are finally passed. According to the latest advices from Canada there is every reason to believe that the International Bridge will be opened for traffic in August next. The traffic at present passing between Detroit and Buffalo, even with the limited carrying capacity of a ferry-boat, exhibits gratifying results. Further sections of the Intercolonial railway will also be opened during the present year, and will be of assistance to the traffic of the Eastern section

of the Grand Trunk Railway. After the expenditure of the proceeds of the \$10,000,000 of new ordinary stock which it is proposed to issue, the directors feel that a new condition of things will be established on the Grand Trunk Railway. The line will be made equal, as regards permanent way and rolling stock, to any railway on the American continent. Canada and the Western States of the Union in connection with it are advancing rapidly in population and wealth. There is now more reason than at any previous time to hope that the company will at last surmount its difficulties, and be placed in a fair way to realize that measure of success which the directors and proprietors have so anxiously and persistently labored, in spite of repeated disappointments, to achieve. As, after the passing of the bill, the first and second preference bonds will become first and second preference perpetual stocks, due notice will be given as to the time when these bonds are to be sent to the office for conversion, and for the capitalization of the interest due upon them.

## General Railroad News.

### ELECTIONS AND APPOINTMENTS.

—The Paris & Decatur Railroad Company has chosen the following directors and officers: E. G. Harvey, Chilion Jones, F. C. Stratton, Paris, Ill.; D. Hitchcock, Arcola, Ill.; W. J. Sylvester, Decatur, Ill.; Jacob Willis, Arcola, Ill.; E. A. Buck, Buffalo, N. Y.; James Hunter, Wm. Adams, Sr., New York; W. P. Standish, Newark, N. J.; John J. Morton, Philip Campbell, Paris, Ill. Robert G. Harvey, President; Chilion Jones, Vice-President and General Passenger Agent; F. C. Stratton, Secretary and Treasurer; Philip Campbell, Auditor and Purchasing Agent; D. Brown, Assistant Freight and Passenger Agent; James Hunter, General Eastern Agent; George B. Phinney, Chief Engineer; James Sanderson, Trainmaster.

—Mr. E. M. Talbot, Chief Engineer and Secretary of the Lafayette, Muncie & Bloomington Railroad, is serving as Engineer of the Lafayette, La Salle & Clinton Railroad.

—The Baltimore Car-Wheel Company, recently incorporated as a stock company, and succeeding what was known locally as "Cochran's Foundry," has chosen the following directors: William S. G. Baker, President and Treasurer; W. J. Cochran, Superintendent; J. Hall Pleasant, Charles J. Baker, E. W. Robinson.

—W. H. Adkins is appointed Train Dispatcher of the Selma Rome & Dalton Railroad, to succeed W. S. Maynard, appointed Assistant Superintendent.

—J. H. Vestal has been appointed Train Dispatcher of the Alabama South and North Railroad, with office at Birmingham, Ala.

—J. M. Whitman has been appointed Chief Engineer of the Chicago & Pacific Railroad, in place of J. M. Raymond, resigned. Mr. Whitman was formerly with the Central of Iowa.

—George H. Daniels, of Elgin, Ill., has been appointed General Passenger and Freight Agent of the Chicago & Pacific Railroad.

—At the annual meeting of the Detroit, Monroe & Toledo Railroad Company recently, the following board of directors was elected: Horace F. Clark, Augustus Schell, James F. Banker, New York; Wm. Williams, Buffalo; Wm. L. Scott, Erie, Pa.; A. Stone, Jr., H. B. Payne, J. H. Devereux, C. P. Leland, Cleveland; Albert Keep, Philo Moorhouse, Chicago.

—At the annual meeting of the Washington & Ohio Railroad Company at Alexandria, Va., April 16, Mr. Lewis McKenzie was re-elected President, with the following board of directors: C. F. Lee and A. Jamison, Alexandria and Fairfax; Henry Heaton and C. B. Ball, Loudoun; B. Morgan and R. H. Lee, Clarke; and F. W. M. Holliday, Frederick. The directors subsequently re-elected R. H. Haverer, General Superintendent, and Washington Blythe, Chief Engineer.

—J. B. Dougherty and L. H. Washburne, of Muscatine County, Iowa, have been chosen directors of the People's Narrow-Gauge Railroad Company, to fill vacancies.

—Mr. J. H. Devereux, late General Manager of the Lake Shore & Michigan Southern Railway, has been chosen President of the Cleveland, Columbus, Cincinnati & Indianapolis Railroad Company, in place of H. B. Harbut. Mr. Harbut becomes Vice-President in place of Mr. Parsons, who has resigned that office.

—The office of Railroad Commissioner has been created in Michigan, and Samuel S. Cobb, a retired merchant of Kalamazoo, has been appointed to the position.

—Mr. Willis Phelps, of Springfield, Mass., has been chosen President of the New York, West Shore & Chicago Railroad Company, in place of J. M. Courtenay, resigned. Mr. James Bell has been chosen Vice-President. Mr. Phelps is a well-known extensive railroad contractor.

—At the annual meeting of the Pemberton and Hightstown Railroad Company at Mount Holly, N. J., April 17, the following were elected directors to serve for the ensuing year: John G. Stevens, Ashbel Welsh, Richard Wain, Alexander Shreve, James W. Allen, Nicholas Wain, Jr., and Collen E. Meira. At a meeting of the directors, the following officers were elected: Nathaniel S. Rue, President; Richard Wain, Vice-President; Joseph E. Shreve, Treasurer; James L. Rue, Secretary.

—Mr. W. W. Card, of Denison, O., who was formerly connected with the Pittsburgh, Cincinnati & St. Louis road, has been appointed Superintendent of the Lake Shore & Tuscarawas Valley Railroad, in place of H. M. Townsend, who has resigned.

—Mr. P. Murphy has been appointed Master Mechanic at Cumberland, Md., on the Baltimore & Ohio road, in place of Peter Sisco, resigned.

—The board of directors of the Mobile & Ohio Railroad Company has re-elected all the old officers as follows: A. Murdock, President; C. E. Rushing, First Vice-President; J. J. Walker, Second Vice-President; A. L. Willoughby, Secretary and Treasurer; Oliver S. Beers, Auditor; George N. Stewart, General Solicitor.

—Mr. H. H. Smith, of Jackson, Mich., has been re-elected President of the Detroit, Lansing & Lake Michigan Railroad Company for the ensuing year.

### PERSONAL.

—The Springfield Republican sketches as follows the railroad service of Mr. George Bliss, who died in Springfield, Mass., April 19:

"The chief public work of Mr. Bliss's career was his carrying the Western Railroad (now Boston & Albany) to a successful completion and putting it in full operation. This engaged almost his whole activity for ten years, from 1836 to 1846, during which, with the exception of a single year (1843) he was the planning mind and working hand of the enterprise.

"Soon after withdrawing from the management of the Western Railroad, Mr. Bliss went to Europe in May, 1846, and returned in September, 1847. At this time Mr. Bliss believed that his labors in railroad management were over, but in the following year (1848) Gov. Washington Hunt, of New York, proposed that Mr. Bliss should join him in buying the Erie & Kalamazoo

road, in Ohio and Michigan, afterward united with the Michigan Southern road, and this led to another season of railroad engagements. In 1849, the Erie & Kalamazoo road, having been rescued from its embarrassments and completed under his direction, was leased to the Michigan Southern road, and Mr. Bliss was chosen a director of that line, not yet opened through to Chicago. Before 1850 he became President of the Michigan Southern road, giving his whole time to it, and saw it completed to Chicago, in June, 1852, when he resigned office. But, in 1853, having succeeded so well with these roads, he was urged to take the Presidency of the Chicago & Mississippi road, which, by way of Joliet, connects Chicago with Alton. He accepted this place for a year, and gave it up in December, 1854, having seen it finished and put in operation from Joliet to Alton, 230 miles. Nor did this close his railroad service, for, in 1857, when the Michigan Southern road had become heavily embarrassed through the fault of others, Mr. Bliss was called on to serve once more as director; in 1858 he was made President, and held that place till May, 1860, when he finally withdrew from all active business, at the age of 67. In all these railroad enterprises he had been obliged to make up for the failure or the incapacity of others, and his success was such as to give him a great reputation in that business. He was one of the originators of the Hartford & Springfield Railroad, and was an active director of the Chicago & Rock Island—the first iron road which reached the Mississippi. Including the Western Railroad, he brought to completion more than 600 miles of the through line between Boston and the valley of the Mississippi, and this in the infancy and early development of our great railroad system.

—The Buffalo (N. Y.) Courier, of April 25, says: "The present indications are that James Tillingham, Esq., will retain the general superintendency of the New York Central & Hudson River Railroad, notwithstanding his acceptance of the managing directorship of the Buffalo, New York & Philadelphia Railroad. The 'powers that be' of the Central have not received his resignation with any favor and have shown no disposition to surrender him. On the contrary, they have ceded to him wider powers, and have offered him a large advance upon his former salary. Mr. Tillingham, who is at present at Louisville, has been pressed strongly for information in regard to his determination, but his reticence remains unbroken, and his final decision remains to be announced."

—Mr. James F. Clark, Roadmaster of the Chicago, Burlington & Quincy Railroad, has resigned his position. It is reported that he has been appointed Assistant Superintendent of the Union Pacific.

### TRAFFIC AND EARNINGS.

—The earnings of the Kansas Pacific Railway for the second week in April were: From passengers, \$31,444.10; freight, \$48,888.69; mails, \$2,055.31; total, \$82,388.10. Of this amount \$2,137.86 was for transportation of troops, mails and government freight.

—The earnings of the St. Louis & Iron Mountain Railroad for the first week in April were: 1873, \$54,670; 1872, \$14,687; increase, \$9,983, or 22½ per cent.

—The earnings and expenses of the Iron Railroad for the year 1872 were as follows:

Gross earnings (\$7,867 per mile).....	\$102,271 53
Expenses (54½ per cent.).....	55,558 35
Net earnings (\$3,593 per mile).....	\$46,713 18

This is an increase of \$9,392.94, or 10½ per cent., in gross earnings, and an increase of \$23,515.00, or 10½ per cent., in net earnings over the previous year. The road is 13 miles long, from Ironton, O., on the Ohio River, north to Center Station.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the third week in April were \$23,473.79. The earnings of the St. Louis Division for the week were: 1873, \$14,788.74; 1872, \$10,441.72; increase, \$4,347.02, or 41½ per cent.

—The earnings of the Great Western Railway of Canada for the week ending April 11 were: 1873, \$24,785; 1872, \$24,549; increase, \$236, or 1 per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending April 12 were: 1873, \$39,700; 1872, \$37,000; increase, \$2,700, or 7½ per cent.

—The earnings of the Western Railroad of North Carolina for the year 1873 were as follows:

Gross earnings (\$1,646 per mile).....	\$70,792 93
Expenses (74½ per cent. of earnings).....	52,514 92
Net earnings (\$424 per mile).....	\$18,348 01

The increase in gross receipts was \$17,253, or 32 per cent., over the preceding year. The road runs from Fayetteville, N. C., northwest to Egypt, 43 miles.

—The earnings of the Rockford, Rock Island & St. Louis Railroad for the month of January were \$72,064.68; working expenses, rentals and taxes, \$61,582.30; net earnings, \$10,482.38. For the 19 months ending with January the earnings were \$1,655,069.87; working expenses, rentals and taxes, \$1,279,951.89; leaving the net earnings, \$375,117.98.

### CHICAGO RAILROAD NEWS.

#### The Pullman Mutual Benefit Association.

This is the title of a society organized in Chicago, March 15, and incorporated under the laws of the State of Illinois, whose object is "to enable all employees of sleeping or palace car companies, and such other persons as may desire, to have their lives insured at a comparatively slight cost to themselves." An initiation fee of two dollars is charged, and an assessment of one dollar is made upon the death of a member, for the benefit of his heirs. When there are two thousand members, a new class is to be formed. The officers are all officers of the Pullman Palace Car Company, A. B. Pullman being President, Charles W. Angell, Vice-President; E. B. Parke, Secretary, and S. A. Mosher, Treasurer, who are respectively Second Vice-President, Secretary, Receiving Cashier and Cashier of the Pullman Company. The board of directors consists of employees and officers of the company, viz.: Col. D. N. Welch, General Superintendent; John Bommer, General Accountant; E. Putnam, Second Vice-President's Secretary; Frank Bennett, Assistant Superintendent; Joseph Anthony, John Geraty, H. S. Cooper, conductors.

#### Chicago, Burlington & Quincy.

The Aurora (Ill.) Beacon says that this company is now constructing 100 grain and merchandise cars monthly, 50 at the Aurora shops and 50 at Galesburg and Burlington. Two Pullman parlor cars are being finished in the Aurora shops, and two postal cars are under way.

#### Illinois Central.

There is an increasing disposition on the Southern States to establish more intimate relations with the North in the line of agricultural and horticultural products. The demand for Southern fruits in Chicago is constantly on the increase, while the Southern demand for Northern farm products is undoubtedly growing. At the present time, while corn is only worth about 20 cents at Bloomington, Ill., at Okolona, Mississippi, it is worth \$1.10 per bushel; and yet Okolona is but little further



from the center of Illinois than is Toledo, the lake port to which great quantities of this grain is shipped from Illinois. The near approach of the completion of the Mississippi Central road to a point opposite Cairo is therefore regarded with much interest in the South, since it will permit of a much freer mutual exchange of products than is now possible between the North and the South. In the benefits of this increased business in the Illinois Central Railroad must largely participate.

#### Lake Shore & Michigan Southern.

This company has just given orders for the construction of 150 new locomotives and 1,000 freight cars, and it will prosecute the work of double-tracking its road from Elkhart to Chicago as rapidly as it can be done, and hopes to have it completed the present year.

#### The New Depot.

All the general offices of the Chicago, Rock Island & Pacific Railroad Company were removed this week into the new depot building, constructed on the site of the one which was consumed in the great fire. The offices of the Lake Shore & Michigan Southern road (such as are in Chicago), were also removed to the building, with the exception of the engineer's department, which will be removed from Laporte, Ind., within a few days. It is proposed to inaugurate the structure by a grand concert within a few weeks, which will be held within the building under the direction of Mr. Gilmore, of Boston, of Jubilee fame. The arrangements are in progress and will be perfected within a few days.

### ANNUAL REPORTS.

#### Mobile & Ohio.

This company owns a line from Mobile, Ala., northward to the Mississippi River at Columbus, Ky., 472 miles, with branches from Narkoota, Miss. (163 miles north of Mobile), to Gainesville, Ala., 21 miles; from Artesia, Miss. (219 miles north of Mobile), to Columbus, Miss., 14 miles; and from Maldon, Miss. (240 miles north of Mobile) to Aberdeen, Miss., 10 miles, making a total of 517 miles of road.

The earnings and expenses for the year 1872, as compared with the previous year, were as follows:

Earnings from:	1872.	1871.
Passengers.....	\$734,970 39	\$681,460 92
Freight.....	2,039,681 25	1,954,217 76
Mails.....	69,705 95	49,02 00
Express.....	67,150 00	54,750 10
<b>Total.....</b>	<b>\$2,952,507 59</b>	<b>\$2,739,448 68</b>
Expenses for:		
Repairs of roadway.....	\$574,768 35	\$582,286 10
Repairs of machinery.....	522,211 34	512,779 48
Conducting transportation.....	792,016 92	793,001 48
Bureau expenses.....	41,162 57	.....
<b>Total expenses.....</b>	<b>\$1,930,219 18</b>	<b>\$1,894,167 06</b>
<b>Net earnings.....</b>	<b>\$1,022,288 41</b>	<b>\$845,281 62</b>

The increase in passenger receipts was \$53,509.47, or 7.85 per cent.; in freight receipts, \$135,463.49, or 6.93 per cent.; and in total earnings, \$213,058.91, or 7.77 per cent. The increase in expenses was \$36,052.12, or 1.90 per cent., and in net earnings, \$177,006.79, or 20.94 per cent. The earnings per mile of road compared with previous years were:

	1869.	1870.	1871.	1872.
From passengers.....	\$1,366	\$1,134	\$1,320	\$1,424
Freight.....	2,260	3,411	3,485	4,049
Mail and express.....	214	211	201	247
<b>Total.....</b>	<b>\$4,370</b>	<b>\$4,746</b>	<b>\$5,006</b>	<b>\$5,720</b>

The earnings per train mile were:

	1871.	1872.
Passenger trains.....	\$1.49	\$1.26
Freight trains.....	3.06	3.25
All trains.....	2.32	2.23

The expenses in 1872 were 65.38 per cent. of earnings against 69.11 per cent. in 1871.

During the year, 398,884 passengers were carried, equivalent to 16,312,518 carried one mile. The average receipts per passenger per mile were 4.48 cents against 4.31 cents the previous year. The increase in the number of passengers carried one mile was 34 per cent. The report states that while the average number of seats provided on passenger trains was 125, the average number occupied was only 25, or only one-fifth the capacity of the cars.

In the freight traffic there was an increase of 40,983 tons, or 8,392,415 tons moved one mile, over 1871, being an increase of about 18 per cent. The average amount received per ton per mile was 3.80 cents, against 4.15 cents in 1871. Of cotton, 184,676 bales were carried, of which 165,824 bales were moved southward and delivered in Mobile, and 17,852 bales were moved northward. The mileage of locomotives was: On passenger trains, 681,302; freight trains, 638,218; gravel trains, 203,856; switching, 98,285; total mileage, 1,621,661 miles. The average cost per mile run was: On the Southern Division, 25.6 cents; on the Middle Division, 29.3 cents, and on the Northern Division, 22.6 cents. There were in service 89 locomotives, of which three were purchased during the year. There are in addition 20 locomotives, which require rebuilding, and an addition to the present shops sufficient to rebuild 10 of these during the present year is recommended. There were on the road at the end of the year 40 passenger, 1 sleeping, 11 baggage and mail, 4 express, 747 box, 308 platform and 18 stock cars, of which 3 passenger, 4 baggage, 3 express and 166 freight cars were added during the year, all except the three passenger cars having been built at the Whistler shops. The rolling stock of the passenger trains has been partly equipped with the Westinghouse brake. A large increase in rolling stock is needed.

The past winter has been very severe upon the track, and a considerable expenditure will be needed to put it in as good condition as it was in the fall. Several new sidings have been put in and others lengthened during the year.

The citizens of Oktibbeha, Miss., have voted \$150,000 to aid in the construction of a branch from Artesia to that place. In return for this amount they are to receive an equal amount in stock of the company. Arrangements have been made to aid the Vicksburg & Nashville Company in constructing its road from Okolona westward. But little benefit has been thus far derived from the connection with the Alabama & Chattanooga road. That road is now run by a receiver and with such an insufficient equipment as to prevent it from doing any considerable business.

The report concludes by strongly recommending the increase of stock as proposed by the board of directors. One share of new stock is to be issued to each holder for each share of old stock now held. 25 per cent. to be paid in cash and 75 per cent. to be regarded as a dividend. This is believed to be the best way of dividing that portion of the earnings which has been used in improving the road, while the 25 per cent. paid will enable the company to pay off the floating debt. The capital account now stands as follows:

Stock.....	\$4,466,475 84
Bonded debt.....	10,839,144 46
Floating debt (less cash).....	1,176,938 03

Total (\$31,281 per mile).....\$16,482,558 33  
With the addition of \$4,466,475.84 of new stock, the capital

account (excluding the floating debt) would be \$19,771,996.14, or \$38,244 per mile.

### OLD AND NEW ROADS.

#### New Haven, Middletown & Willimantic.

The gap of six miles between the ends of this road has been closed and construction trains now pass over the whole length of the road. Trains will be put on as soon as the ballasting can be completed, which will be in two or three weeks.

#### Dividends.

The Long Island Railroad Company will pay a dividend of 10 per cent. in stock May 26. Transfer books were closed April 30 and will be reopened May 27. The United States Express Company paid a quarterly dividend of 2 per cent. May 1.

#### Kansas City & St. Louis Narrow Gauge.

A dispatch from Kansas City, Mo., says that work is to begin on this road at once, the courts having ordered the county commissioners to issue the bonds voted to the company, which have been in litigation.

#### Columbus, O., Union Depot.

The contract for this building has been let to Herabizer, Adams & Co., of Columbus, for \$177,940. The building will be 185 feet front and 600 feet deep and will contain seven tracks. At the west end, above the depot proper, there will be two stories of office rooms, and above all this, towers on the north-west and south-west corners, each 374 feet square, with Mansard roofs. The distance from the ground to the top of the cornice will be 72 feet; the addition of 18 feet of Mansard will make a total height of 90 feet. The second and third stories will extend back only far enough to give proper space for a tier of office rooms, passages, etc.

On the north side of the depot there will be no rooms of any kind, or platforms. On the south side (within the depot) a space 30 feet wide, and the entire length of the depot, will be occupied with waiting and baggage rooms, ticket and telegraph offices, dining room, kitchen (with cellar under it), closets, etc., in all about twenty rooms, besides three passages from the brick wall on the south side of the building to the platform, from which the rooms will be entered. The gentlemen's waiting room will be 39 by 75 feet, the ladies' waiting room 39 by 61 feet, and between these two rooms, and at the center of the south line of the depot, will be located the ticket office.

#### Consolidation of Eastern and Boston & Maine Railroads.

The Legislature of Massachusetts has referred to the Railroad Committee a bill authorizing the consolidation of these two companies. In the course of the debate on the reference of the bill, it was stated that the Eastern Company desired only a bill permitting a consolidation, while the Boston & Maine opposed the passage of any bill at all. The bill was introduced in the Legislature last year, but no action was taken on it.

#### Valley of Virginia.

The Rockbridge (Va.) *Citizen*, of recent date, says: "A telegram was received Monday morning from Mr. Garrett, President of the Valley Railroad, substantially to the following effect: That on the 8th a proposition was submitted to the Finance Commissioners of Baltimore to place 30 per cent. of her subscription in escrow, and that Rockbridge should place 30 per cent. of her bonds also in escrow, both to become available upon the letting of the road, according to the understanding some weeks ago. This was declined. A resolution was asked to the effect that if Rockbridge should be put upon the same footing with Staunton and Lexington, and putting the road under contract, that payment would be ordered. This, too, was declined. The Commissioners deny their right to give checks, or order it to be done. They decline to pass a resolution that, if certain things are done, that they will give an affirmative answer, on the ground that it might trammel them hereafter upon the appearance of new facts. They comment on various facts connected with the county subscriptions, and upon the position of Botetourt and Roanoke, and the action of the Virginia Legislature.

#### Salisbury & Turtle Creek.

Surveys are being made for a railroad from Turtle Creek (on the Pennsylvania Railroad, 13 miles east of Pittsburgh) north-east to Salisbury on the West Pennsylvania road, a distance of about 25 miles. This line, if built, would form, with the West Pennsylvania, a loop line from Turtle Creek to the Pennsylvania road again at Blairsville Intersection.

#### East Pennsylvania.

The contractors have commenced work on the second track between Emaus and Allentown.

#### Western North Carolina.

In the United States Circuit Court at Greensboro, N. C., April 14, in the suit of Henry Clews against this company, Major Smith, President of the North Carolina Railroad Company, was appointed Receiver of the Western North Carolina Railroad.

#### Bedford & Johnstown.

Surveys are to be made for a railroad from Bedford, Pa., northwest to Johnstown, on the Pennsylvania Railroad, a distance of about 40 miles.

#### Bedford & McKee's Gap.

Work on the new branch line from Bedford, Pa., north to McKee's Gap on the Hollidaysburg Branch of the Pennsylvania road, is progressing rapidly.

#### Utica, Chenango & Susquehanna Valley.

The directors of this company met in Utica, April 23, and adopted a resolution authorizing the issue of the \$1,000,000 new stock of the company. The lessee of the road, the Delaware, Lackawanna & Western Railroad Company, guarantees 6 per cent. interest on this stock. The company has no bonded debt.

#### Indiana & Illinois Central.

The first train of cars passed through from the Wabash River at Montezuma, Ind., to Tuscola, Ill., recently. The track through Tuscola entirely across Douglas County has been laid for some months, but that from the Douglas County line to Montezuma, about 30 miles, is new. The track-layers are now at work between Tuscola and Decatur.

#### Central Stock Yard & Transit Company.

A company by this name has been organized and will soon, it is said, commence the erection of large stock-yards and slaughter-houses in Jersey City, adjoining the Erie Railway and the Harsimus Cove Branch of the Pennsylvania road. The yards are to be connected by tracks with all the roads entering Jersey City and Hoboken, and extensive wharves will be constructed. It is also said that the stock yards at Communipaw will be discontinued, or transferred to this point. The officers of the company are: Samuel W. Allerton, of Chicago, President; David H. Sherman, General Superintendent, and John R. McPherson, Treasurer.

#### Midland Pacific.

This company has filed in the office of the Secretary of State of Nebraska amended articles of incorporation which authorize

the company to build a branch from some point in Otse County, Neb., to a point in Kansas opposite St. Joseph, Mo., and also a branch line from a point in Seward or York County to the northern line of the State.

#### Lee & New Haven.

This company is making an effort to have the grant of \$900,000 made to it by the State of Massachusetts, in 1868, revived. The road, by the terms of the grant, was to be finished from Lee to the Connecticut line, a distance of about 25 miles, by June 5, 1871. The time was subsequently extended to June 5, 1872, and later to June 5, 1875, but it is now the opinion of the Attorney General of the State that the time for issuing the \$900,000 State scrip expired in June, 1872, and was not extended by the last act of the Legislature. The contract for the construction was made last fall, and but little work has been done thus far. If the Legislature should fail to confirm the grant, the question will probably be taken before the courts for final decision.

#### Transcontinental.

This company has completed its telegraph line as far west as Sherman, Tex.

#### Missouri, Kansas & Texas.

Texas papers report that this company has "fully decided" to construct its southeastern branch from Dennison southeast to Tyler, Texas, about 190 miles. The International & Great Northern, however, is already extending its track northwest from Tyler. The Missouri, Kansas & Texas is also said to be surveying from Dennison westward.

#### Texas & Pacific.

Our Dallas correspondent informs us that on the 18th of April the track was laid on this road from Dallas east 20 miles to the Mesquite River. A station is established at Syene, 16 miles east of Dallas.

A Texas paper reports that the company has purchased the road-bed, charter and franchise of the North Louisiana & Texas Railroad Company, and will soon begin work on the completion of that road from Monroe, La., west to Shreveport, the line being in operation from Monroe east to the Mississippi opposite Vicksburg.

#### Northern Pacific.

A subscriber on the line writes us that the Dakota Division is to be opened immediately, a large force of men having already gone to the front to finish laying the section east of the Missouri, of which between 30 and 40 miles remain to be ironed. It is reported that G. N. Smith, now Train Dispatcher, will be Superintendent of the Dakota Division. Mr. R. B. Small has succeeded Mr. C. D. Wiley as Master Mechanic of the Minnesota Division, and Mr. Rossiter is Master Mechanic of the Dakota Division. The road has been blocked by snow but once during the past winter, and then two days in January.

#### Lafayette, La Salle & Clinton.

This company purposes to build a railroad from a junction with the Cincinnati, Lafayette & Chicago and Toledo, Peoria & Warsaw roads at Sheldon, Ill. (close to the line between Indiana and Illinois), northwestward through La Salle, Ill., to Clinton, Iowa, about 160 miles. Mr. E. M. Talbot, the engineer, has made preliminary surveys from Sheldon to La Salle, and reports that the line can be constructed very cheaply. It is intended to cross the Illinois at La Salle just above high water, and under the Illinois Central's bridge. The surveys are to be completed to Clinton immediately.

#### Central Vermont.

This company, incorporated to succeed the Vermont Central, was to open books for subscriptions to its capital stock at the Welden House, in St. Albans, Vt., on the 30th of April at 3 p. m. George Nichols, John W. Stewart and Bradley Barbour are the Commissioners.

#### Railroad Taxation in Delaware.

The Wilmington (Del.) *Commercial* says that before the recent adjournment of the Delaware Legislature a bill was passed regulating the tax on railroads, by which the Philadelphia, Wilmington & Baltimore Railroad is to be taxed \$27,000 in lieu of all other than the ten cent tax. The ten cent tax may be commuted for by paying the sum of \$13,000, and the railroad may graduate this tax, as is most conducive to the interests of the public. Discrimination in fares or freights against any one may be punished by suit and recovery of ten-fold the amount so charged. Another bill provides for the graduation of the ten cent tax by permitting all other roads to pay over such lump sums as will be proportioned to their passenger receipts, in the same ratio as the amount paid by the Philadelphia, Wilmington & Baltimore railroad holds to theirs.

#### Toledo, Wabash & Western.

An order from the office of the Vice-President directs that all accounts of the Operating Department must hereafter be sent to the Auditor instead of the Treasurer, as heretofore.

#### Contra Costa.

Surveys have been made for a narrow-gauge railroad in Contra Costa County, Cal., from Martinez south through Pacheco up the San Ramon Valley to Walnut Creek, a distance of 21 miles. The estimated cost, including wharves at Martinez, is \$240,000. Another line, 19 miles long, from Walnut Creek to Oakland, has been surveyed, but has much heavier grades than the first line. The object of the road is to provide an outlet to navigable water, which would be attained by going either to Martinez or Oakland.

#### New York & New England.

This company has applied to the Massachusetts Legislature for an act confirming the proceedings of the Berdell bondholders in organizing the company as successor to the Boston, Hartford & Erie. The company also asks leave to take or purchase in South Boston lands and flats east of First street, and between a street on north and B street and B street extended on the south; and all or any portion of the lands and flats east of the line of act of May 1, 1852, and north of B street extended, and extending on the north and east of the commissioner's line. In Boston proper, all or any portion of the land and wharves south of Federal and Broad, and Washington avenue on the west, and the foot of Congress street on the east. It is not proposed to take all of this territory, but only so much as may be found necessary for the purposes of the company.

#### Baltimore & Potomac.

The tunnel through Baltimore connecting this road with the Northern Central will, it is said, be completed in about two months. The tunnel is thus described by the Baltimore *American*:

"Taking the Northern Central Railway as a base line, double tracks diverge from it, the first at Boundary avenue and the other a few hundred yards farther north. They each enter a tunnel and are lost sight of until they emerge into daylight at John street, where they unite and take the main tunnel, following Boundary avenue to Wilson street, and then turning into that street, or rather under it, thirty-five feet from the surface, they keep a straight course with the line of the street until the open cut is reached near Fulton avenue. Through trains southward bound will take what might be called the northern fork of



the tunnel, and the passengers will see but little of the city of Baltimore. Trains which leave the Calvert Station, and also those that come from the Philadelphia, Wilmington & Baltimore Railroad by the Union road will take the other fork. Of course, northern-bound trains will take the fork branching to the north at the John street cut, and the trains from Baltimore and Philadelphia will take the southern fork. The connection with the Philadelphia, Wilmington & Baltimore road will be made by the Union Railroad and tunnel, which commences at Belvidere bridge, and continues on through the eastern section of the city to lower Canton and tide water."

#### Railroad Taxation in New Jersey.

Mr. James S. Yard, State Commissioner of Railroad Taxation, has issued a circular to the assessors of the different counties with reference to their duties under the new law providing for the taxation of railroad property.

The act provides that upon all the real property in the State occupied, used or owned by railroad companies, whether as lessees or otherwise, and whether used for the purposes of their road or otherwise (excepting their main stem or road bed and track one hundred feet in width, and excepting a tract of land at the termini of their roads not exceeding ten acres, to be in one parcel, with the buildings and improvements thereon), and upon all the improvements thereon, not by the way of repairs, such companies shall pay a county or municipal tax of one per cent.; and it further provides that a valuation of said property shall be made once in three years, which shall be the basis of the annual taxation thereupon for the year in which such valuation is made and for the two years next succeeding.

The assessors are requested to furnish Mr. Yard with an assessment or valuation of all the railroad property lying within the bounds of each township, or ward, excepting such as is exempt as above stated, particularly specifying the nature of such property, whether depots, machine shops, car shops, repair shops, vacant lots, or other real estate, and the name of the company owning, occupying or using the same. The several railroad companies owning or occupying such property have been notified to forward to him a statement of the valuation placed thereupon by them, and notice of the time and place at which the said valuation will be finally considered and fixed by him as Commissioner of Railroad Taxation, in accordance with the provisions of the fifth section of the aforesaid act.

#### Pennsylvania—New Jersey Divisions.

The following statement of the amount to be expended on the improvement of the New Jersey lines this year is said to be from official sources: For work on third and fourth tracks, New York Division, \$150,000; second track on Amboy Division, \$90,000; new sidings on Amboy Division, \$115,000; Belvidere Division and Trenton depot, \$150,000; new local depots, \$75,000; to complete inland stocking ground at South Amboy, \$30,000; total, \$910,000. In addition to this amount will be the work on the new shops on the Hackensack meadows and the enlargement of the Jersey City depot, and also the amount which must be expended on the Harsimus Cove improvements under the terms of the lease.

#### Pajaro & Santa Cruz.

A company has been organized to build a narrow-gauge railroad from Santa Cruz, Cal., east to the Pajaro Station of the Southern Pacific road, a distance of about 28 miles. The County of Santa Cruz has voted a subsidy of \$6,000 per mile, and stock subscriptions to the amount of \$75,000 have been made. The estimated cost of the road is \$300,000.

#### Martinsburg & Potomac.

The Cumberland Valley Railroad Company is to be asked to furnish the necessary funds (about \$170,000) to complete this road. It will form an extension of the Cumberland Valley road from its present terminus on the south bank of the Potomac to Martinsburg, W. Va., a distance of 12 miles.

#### Annual Meetings.

The annual meeting of the Kansas Pacific Railway Company will be held in Lawrence, Kan., May 1.

The annual meeting of the Denver Pacific Railroad Company will be held in Denver, Col., May 5.

The St. Louis, Alton & Terre Haute Railroad will hold its annual election in St. Louis, June 2.

The Chicago & Northwestern holds its election June 4. Transfer books closed April 30, and will be reopened June 7.

#### Southwestern, of Georgia.

The track on the extension from Albany, Ga., to Blakely, has been laid to Leary's Station, 23 miles southwest of Albany, and passenger trains are running from Albany to Leary's.

#### San Luis Obispo.

This company proposes to build a railroad from the town of San Luis Obispo, Cal., to the port on the bay of the same name, a distance of 13 miles. The engineer estimates cost of road (3-foot gauge) and equipment at \$140,757.96—or little over \$10,000 per mile. The officers of the company are David C. Norcross, President; Charles W. Dana, Treasurer, and C. H. Phillips, Secretary.

#### Painesville & Youngstown.

Work on the grading of this road is progressing rapidly. The extension of the pier at Fairport, the Lake Erie terminus of the road, has been commenced and will be completed this season.

#### Lake Shore & Michigan Southern.

A correspondent of the Cleveland (O.) *Herald* says that this company intends this season to put down a track from Painesville, O., to Fairport, on Lake Erie, a distance of about three miles.

It is said that the company intends to erect additional shops at some point east of Cleveland. There is a lively competition among the towns along the line to secure the location of the proposed shops.

#### Penobscot Bay & River.

The town of Wintport, Me., has voted to take stock in this company to the amount of five per cent. of its valuation.

#### Portsmouth, Great Falls & Conway.

This company will apply to the next Legislature of New Hampshire for leave to construct a road from Great Falls to Dover, to connect with the Dover & Portsmouth road, which is now being constructed. The proposed line would be about three and one-half miles, and by this route the distance from Portsmouth to Great Falls would be some four miles less than by the present line to South Berwick.

#### Union Freight Railway.

The bill giving the Union Freight Railway Company of Boston authority to haul passenger cars over its road has been passed by the Legislature and signed by the Governor.

#### Cincinnati, Hamilton & Dayton.

The Indianapolis *News* says that a cut-off road will be built this season from Dayton, O., to Loveland, on the Marietta & Cincinnati. This line would be about 17 miles long.

#### Northern Pacific.

An expedition of United States troops is to be ready to leave Fort Rice, Dakota, on the 15th of June, to protect the engineers of this company in making surveys for the line of the road between the Missouri River and the Rocky Mountains. There are to be ten companies of cavalry, nineteen of infantry, eighty-five Indian scouts, and a detachment of artillery suf-

ficient to man two Rodman guns, all under the command of Col. D. S. Stanley, of the Twenty-second Infantry. The expedition is to have sixty days' subsistence and forage, and arrangements are to be made to obtain further supplies. It will remain in the field till October 15, and not later than November 1.

#### North Carolina.

The injunction restricting the Richmond & Danville Company from altering the gauge of this road from Greensboro to Charlotte has been continued by Judge Albertson at Raleigh, N. C., until the final hearing, but upon condition that the State give bond for \$50,000 with good security to indemnify the said company for damages that might be sustained on or before the 1st of May. If not given by that time the injunction to be dissolved. Both parties have given notice of appeal to the Supreme Court.

#### Railroad Legislation in New Jersey.

The following additional laws, passed by the late Legislature of New Jersey, have been signed by the Governor and become law since our last report:

Supplement to act to incorporate the Toms River & Waretown Railroad Company of Ocean County.

Supplement to an act to incorporate the Paterson & Pompton Railway Company.

Empowering the Perth Amboy & Woodbridge Railroad Company to condemn lands for the use of depots, switches and side tracks.

To incorporate the New Jersey Atmospheric Railroad Company.

#### Thorntown, Newton & State Line.

This company filed its certificate of incorporation with the Secretary of State of Indiana, April 24. The road is to run from Thorntown, Ind., west through Newton to the Illinois State line, a distance of about 45 miles. The capital stock is to be \$50,000, and the incorporators are Joseph Cloud, David Binford, R. H. Reese, C. J. Brundige, R. Neptune, D. M. Roseboom, J. A. Beryman, Simpson Montgomery, Alexander Meharry, J. J. Jones, S. M. Coen, J. W. Plucket and James Reed.

#### Ridgefield & New York.

The directors of this company having been censured for their delay in the work of construction, have issued a circular, in which they ask for additional stock subscriptions to the amount of \$400,000, and pledge themselves in such case to build and equip the road from Port Chester to the town of Danbury, Conn., without calling for any further aid from either old or new subscribers.

#### Railroad Legislation in Delaware.

At its recent session the Delaware Legislature passed the following acts having reference to railroads:

Act to amend an act to incorporate the Delaware & Chester County Railroad Company, passed 1867—allowing the company to borrow \$1,500,000, instead of \$600,000.

Further supplement to an act to incorporate the Smyrna & Delaware Bay Railroad Company, passed February 14, 1865—regarding the route, issuing of bonds, and giving the company the right to consolidate with roads chartered by either Maryland or New Jersey.

Act to amend an act to incorporate the Delaware & Chester County Railroad Company—allowing the directors to increase their number to 13, etc.

Act to authorize the construction of a railroad from the town of Lewes to Rehoboth Bay in the County of Sussex, capital \$100,000.

Act to incorporate the Baltimore, Chesapeake & Delaware Bay Railroad Company—to run between Harrington, Del., and Queenstown, Md.; \$25,000 to be subscribed before the work is to be proceeded with.

Act to amend an act to incorporate the Breakwater & Frankford Railroad Company—appointing commissioners to open books and receive subscriptions to the capital stock of the company.

Act to aid the Breakwater & Frankford Railroad Company to construct a road and for other purposes—the State loans its bonds to the amount of \$200,000 to aid in building this road.

Act to incorporate the New Jersey & Delaware Central Railroad Company—this is a continuation of the North & South Jersey Railroad, now building in New Jersey. The two roads are to connect at Port Penn, and the Central will be continued to Middletown station, thence to Washington; capital stock, \$500,000.

Act entitled a supplement to an act to incorporate the Delaware & Chesapeake Railroad Company, passed March 30, 1869: this act simply revives and continues in force the original charter of the company.

Act in relation to the Wilmington & Reading Railroad Company—allowing the company to construct a railroad between any track now owned by it to the Delaware River, provided the length of the road is not more than seven miles.

Supplement to an act to incorporate the Smyrna Station & Smyrna Railroad Company—allowing this company to vacate its present line and construct a new one.

Act to amend an act to incorporate the Georgetown & Gun-boro' Railroad Company—regarding some minor details.

Act to incorporate the Odessa & Middletown Narrow-Gauge Railroad—to run between Middletown and Odessa; capital stock, \$20,000.

Act to amend an act to further amend an act to incorporate the Seaford & Lewes Railroad Company, passed at Dover, March 3, 1871—increasing the amount of money to be raised from \$100,000 to \$200,000.

Act to enable the Delaware Railroad Company to make provision for the payment and discharge of its present funded debt, and for other purposes—allowing the company to borrow a sum not exceeding \$1,000,000 for the purpose of discharging its funded debt.

Act amendatory of and supplemental to an act to incorporate the Milford & Bay Shore Railroad Company, passed at Dover, March 22, 1871—increasing largely the number of directors and otherwise amending the bill.

Act to repeal and make void "an act to authorize the Queenstown & Harrington Railway Company to construct their road from the Maryland State line to Harrington, in the State of Delaware," passed at Dover, February 26, 1869. This charter was known as the Hamby charter, granted in 1869; and after the passage of the Goldsborough charter, at this session, the Hamby charter was repealed, on account of the fact that both the proposed roads were to run over the same territory.

Act to repeal section 10, chapter 137, volume 12, Laws of Delaware—repealing the clause regulating the charges on the Junction & Breakwater road, and enacting one that allows the company to charge 8 cents per mile for freight and 6 cents per mile for passengers.

Act incorporating the Maryland & Delaware Ship Canal Company, and authorizing said company to construct a canal through the State of Delaware—to unite the waters of the Delaware and Chesapeake, by constructing a canal south of Appoquinimink Creek; capital, \$6,000,000.

#### Covington & Lexington.

Dispatches from Frankfort, Ky., dated April 25, state that the Kentucky Court of Appeals has rendered a decision in the case of the Covington & Lexington Railway Company against the heirs and administrators of R. B. Bowler and others, who, since 1859, have held the road by virtue of a purchase at a sale decreed by the Fayette County Circuit Court to satisfy the Trustee of the second-mortgage bonds. The decision of the

Court is that the heirs of Bowler do not hold the road in their own right, but as trustees for the railway company, and that the commissioners appointed by the proper courts shall adjust the claims between the Bowler heirs and the company from the date of transfer, in 1859, to the date of the restoration of the road to the Covington & Lexington Company. The decision of the Court was unanimous.

The building of the road was commenced in 1850, under a State charter, with \$1,380,000 stock subscription. Loans of bonds secured by double their amount in stock were obtained as follows: Cincinnati, O., and Bourbon County, Ky., each \$100,000; Covington and Fayette County, Ky., each \$200,000; Pendleton County, Ky., \$50,000. These bonds were disposed of by the road. The bonds were issued as follows: First mortgage, \$120,000; second mortgage, \$1,000,000; third, \$600,000; income bonds, nearly \$600,000, making a total debt on this score of \$3,200,000. From 1854 to 1857, the road secured a prosperous business, at the close of which period the board suspended the payment of the interest on the above \$800,000 securities. Early in 1858 the directors appointed a committee to make overtures to the holders of the first and second-mortgage bonds to consent to a postponement of the interest on these bonds for one year. In 1858 a committee of directors reported by printed circular to the stockholders and bondholders that \$800,000 were needed to make the road first class. A few months later, James Winslow, Trustee, foreclosed one first-mortgage bond, and obtained a decree in the Fayette Court for a sale of the road. In October, 1858, it was sold to Bowler, then a director of the company, for \$2,154,000. Bowler, at the time he bought, owned \$1,137,000 of securities, none of them second-mortgage bonds.

An entirely new board of directors, excepting one man, was elected immediately after. The stockholders held a meeting and refused their sanction to the sale. The road was run by the purchasers until the war, when the government took possession of it. After the war, the suit, which has just been decided, was started by the company in the Kenton Circuit Court. Failing there, it was taken to the Court of Appeals eighteen months ago, nearly. The arguments of the plaintiff's counsel were that Bowler, at the time of the purchase, occupying a position of trustee to the company, whether acting in good or bad faith, could hold the road only in the capacity of a trustee to the company.

The mandate fixing the basis for a settlement of the accounts between the parties will be prepared and filed in a few days. The present holders of the road, some time ago, merged it with the Maysville & Lexington in the Kentucky Central Company, under which name the road is now operated. A later dispatch confirms the report of the decision, and states that the court holds that, by accounting to the Bowler heirs and other defendants for their expenses in satisfaction of the judgment of Fayette Court, and repairs and improvements on the road, the company are entitled to a share of profits realized from the road while out of their hands, and to resume control of it upon complying with the terms of the Fayette Court judgment.

#### Texas & Pacific.

The surveying parties have reached Tucson, Arizona, having completed the surveys from Mesquite, New Mexico, to the Pimas villages in Arizona.

#### Mendota, Rockford & Beloit.

This company has filed its articles of incorporation with the Secretary of State at Springfield, Ill. The capital stock is to be \$1,000,000, and the principal office will be at Rockford, Ill. The road is to extend from Mendota, Ill., on the Chicago, Burlington & Quincy, north through Rockford to Beloit, Wis., a distance of about 70 miles.

#### Burlington, Cedar Rapids & Minnesota.

The town of Independence, Ia., has raised \$20,000 to insure the completion of the Milwaukee Extension to that point. The town last year voted \$32,000 for the road, but it was forfeited, the road not having reached Independence by the specified time.

#### New York, West Shore & Chicago.

It is said that a number of capitalists have recently become interested in this company and have subscribed some \$2,000,000 to the stock. Ex-Governor Page, of Vermont, has gone to Europe to negotiate the sale of the bonds. The company has been re-organized, with Mr. Willis Phelps, of Springfield, Mass., as President. The contract for the construction of the road has, it is said, been made with a new construction company.

#### Pittsburgh, Fort Wayne & Chicago.

The Pennsylvania Company, operating this road, advertises for proposals for the grading and masonry of the second track on the main line of this road. In all ten sections are advertised to be let, the total length being 115 miles. The profiles for that part of the work east of Crestline, O., can be seen at the Chief Engineer's office, Pittsburgh, Pa., and for the work west of Crestline at the Engineer's office, Fort Wayne, Ind. Proposals must be sent to Mr. F. Slataper, Chief Engineer, at his office in Pittsburgh, Pa., by noon of May 15.

#### International & Great Northern.

A letter from Mr. Grow, President of the Great Northern Company, states that the road will be finished to the crossing of the Texas & Pacific in a short time, but no work will be done beyond that point. A line to Sulphur Springs has been located, but no work will be done on it at present, owing to the failure of the State to fulfill its promises of aid.

#### Mansfield, Coldwater & Lake Michigan.

An excursion party passed over this road and the Toledo, Tiffin & Eastern, from Toledo to Mansfield, O., April 24. The road between these points will be opened for regular business May 1.

#### Green Line.

A meeting of the representatives of the different companies concerned in this line was held in Louisville, Ky., April 24. The principal object of the meeting was to devise means to obviate the long detention of the cars of the Louisville & Nashville and the St. Louis & Iron Mountain roads upon their Southern connections. It was resolved that 750 additional cars should be put in the line, and that a Superintendent should be appointed to look after the return of cars to the roads where they belong.

#### Salina, Atlanta & Raymond.

Ground was broken for this road at Salina, Kan., April 22. The road is to extend from Concordia, Kan., which is on the projected extension of the Central Branch, Union Pacific road, south through Salina on the Kansas Pacific to Raymond, on the Atchison, Topeka & Santa Fe. The whole length of the road would be about 120 miles.

#### Sabula, Aukley & Dakota.

The cars of this company now run to Cedar Rapids, Iowa, instead of stopping at Marion, the terminus of the road, as heretofore.

#### Joliet & Valparaiso.

Two lines have been surveyed, and it is reported that work will be begun as soon as the final location can be made.

#### Shenango & Allegheny.

A contract has been let for the completion of this road to a point about four miles from Greece City, Pa. Beyond this point the line is not finally located, and it is not known whether



